BEFORE THE ENVIRONMENT COURT

In the matter of	appeals under clause 14 of the First Schedule to the Resource Management Act 1991 concerning proposed One Plan for the Manawatu-Wanganui region.
between	**FEDERATED FARMERS OF NEW ZEALAND ENV-2010-WLG-000148**
and	**DAY, MR ANDREW ENV-2010-WLG-000158**
and	**MINISTER OF CONSERVATION ENV-2010-WLG-000150**
and	**HORTICULTURE NEW ZEALAND ENV-2010-WLG-000155**
and	**WELLINGTON FISH & GAME COUNCIL ENV-2010-WLG-000157**
	Appellants
and	**MANAWATU WANGANUI REGIONAL COUNCIL** *Respondent*

Statement of evidence of Dr Neels Botha

Dated: 14 March 2012

1. INTRODUCTION

Qualifications and experience

1.1. My full name is Cornelius Alewyn Johannes BOTHA.

1.2. I am a Senior Social Scientist and I have the following qualifications:

a) BSc(Agric) (Animal Science), University of Pretoria, 1978.

b) BInstAgrar (Hons) University of Pretoria, 1978.

c) MInstAgrar (Hons) University of Pretoria, 1980.

d) PhD (Agricultural Extension) "An organisational model for extension in South Africa" Unpublished PhD dissertation, University of Pretoria, 1980,

1.3. I have 8 years field experience as an extension officer, 14 years teaching and research experience at tertiary level (University of Pretoria) and 12 years experience in social research in New Zealand (AgResearch). Over the last 12 years, I have led several social research programs in the areas of adult learning, adoption of innovations and policy. During this time, I have run workshops with and interviewed many farmers on different topics and have gained a good understanding of their thinking, decision making processes and their responses to policy. I have noticed how many of them resent policies that they consider to be controlling and overbearing. As part of my role, I have written many research reports, talked at local and international conferences and published scientific papers in my field of expertise, and I am an active member of several international scientific journal referee panels.

1.4. I am familiar with the evidence of those witnesses relevant to my area of expertise which is contained in the "Technical Evidence Bundle" lodged with the Court by the respondent.

Evidence presented at the Council hearing

1.5. I gave evidence at the Council hearing. That evidence is attached to this evidence as an appendix. The evidence lodged at the Council hearing remains my evidence. However, I wish to add to that evidence as set out below.

Expert conferencing

1.6. I attended expert conferencing on 24 and 26 January 2012 with Dr Terry Parminter. A record of that conferencing has been provided to the Court in the form of a conferencing statement. I have included further discussion around areas of disagreement with Dr Parminter in this evidence.

Expert witnesses Code of Practice

1.7. I have read the Environment Court's Code of Conduct for Expert Witnesses as set out in the Court's 2011 Practice Note, 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.

1.8. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of evidence

1.9. My evidence will deal with the following:

a) What does the public want?
b) Is regulation needed at all?
c) Industry self regulation.
d) The problem of free riders
e) Reasonably practicable farming management practices.
f) Discussion around areas of disagreement with Dr Parminter.

2. WHAT DOES THE PUBLIC WANT?

2.1. The Lincoln University biennial survey of people's perceptions of the New Zealand environment is the only survey that provides a context for assessing national (and regional, depending on response rate) level

perceptions and changes of these over time (Hughey et al, 2010). The sixth of these surveys, which happened during 2010 showed that New Zealanders as a group think that key priorities for the government are the economy, health and education, followed by the environment. But for individual New Zealanders the priorities are different and the environment and quality of life are more important drivers than economic considerations.

2.2. For 10 years, spanning 2000-2010, New Zealanders have had overall positive views about the state of New Zealand resources, with only rivers and lakes, and marine fisheries, having significant negative ratings. What is more, over the same period they have considered lowland streams in their regions to be poorly managed and there has been a steady and significant increase in the proportion of New Zealanders identifying farming as one of the main causes of damage.

2.3. Freshwater related issues are the single biggest environmental concern for New Zealanders (Hughey et al, 2010). From the 2010 survey it became very clear that the public wants:

a) Development that does not wreck fresh water environments they recreate in.
b) Environmental and recreation values of rivers protected, but are also willing to see water used, although not at the expense of these other values.
c) An economic value on the commercial use of water and for charging users.
d) Economic and Regulatory approaches for achieving desired outcomes.
e) The ecology and nature of fresh water resources protected because these are highly valued by them.

2.4. It is not only in a broad sense that New Zealanders want clean freshwater. It is also true in the Manawatu. In its application for funding to the Fresh Start for Freshwater Clean-up Fund, the Manawatu River Leaders' Forum stated very clearly that the Manawatu River and its tributaries are valued by the communities within the catchment for environmental, recreational, cultural and economic reasons. It further stated in the same application that the degraded water quality is a risk to water supplies for towns, industry and farms (stockwater and washdown), and in many places for much of the year

the river is unsafe for contact recreation. Cyanobacteria blooms are becoming more common - which are a direct threat to humans and dogs that come into contact with them.

2.5. The Manawatu River Leaders' Forum was brought together by Horizons Regional Council and will receive $5.2 million from the Government's Fresh Start for Freshwater Clean-up fund to aid efforts they are making to clean up the river. The Leaders' Forum applied for Government assistance towards a suite of five projects totalling over $30 million, including upgrading sewage treatment plants, land-based effluent disposal, environmental farm plans and habitat restoration.

2.6. The Manawatu River Leaders Accord clearly states the end state the community wants for the Manawatu River and has received Government funding to achieve this goal. This is a confirmation that the community goals are known, well-defined, deemed important and recognised by all the Manawatu River Leaders' Forum participants. The question is whether regulation is needed to achieve community goals?

3. IS REGULATION NEEDED AT ALL?

3.1. Yes, regulation is needed. Firstly for those farmers who would not change otherwise and secondly, because regulation and voluntarism are not mutually exclusive.

3.2. Regulation and voluntary approaches have social goals; they aim to influence human behaviour. Sinclair (1997) shows that there is a common assumption that self-regulation and government regulation are fundamentally different entities, which by implication do not mix well. Government regulation, he says, is strongly and commonly associated with command and control and that:

a) the essence of command and control and self-regulation are deterrence, and

b) the essence of self-regulation is voluntarism, cooperation, and moral commitment respectively.

3.3. Both of these “pure” forms were unable to achieve their social goals and have resulted in a search for other means of achieving them (Sinclair, 1997). He continues by contending that pitting command and control against self-regulation is a false dichotomy, because “...command and control relies far more on voluntarism than deterrence theorists would comfortably concede, and similarly, self-regulation depends heavily upon either an underpinning of government regulation, or at the very least, upon the threat of government regulation (i.e., cooperation only takes place in the shadow of the law).” I come back to this point later in my evidence.

4. INDUSTRY SELF REGULATION

4.1. In 2003 the Dairying and Clean Streams Accord (“Accord”) set out five targets for dairy farmers:

a) Dairy cattle to be excluded from 50 percent of Accord-type streams, rivers and lakes by 2007, rising to 90 percent by 2012.

b) Fifty percent of regular crossing points to have bridges or culverts by 2007, and 90 percent by 2012.

c) All dairy farm effluent discharges to comply with resource consents and regional plans immediately.

d) All dairy farms to have in place systems to manage nutrient inputs and outputs by 2007.

e) Fifty percent of regionally significant wetlands to be fenced by 2005, rising to 90 percent by 2007.

4.2. Progress is measured by both Fonterra and Regional Councils. Firstly, the results of Fonterra’s annual On-Farm Environmental and Animal Welfare Assessment (“Assessment”) are used. The Assessment involves a trained assessor meeting with dairy farmers and asking them a range of questions aimed at assessing their environmental and animal welfare performance. Two of the questions relate to stock exclusion from waterways. The first question asks farmers how many kilometres of Accord-type waterways they have on their farm. The second question asks what percentages of those waterways have stock access. A farm is only counted as having full stock exclusion if stock are excluded from all Accord-type waterways on the farm.

4.3. Secondly, regional council monitoring of compliance with regional plans and resource consents for dairy effluent disposal is used. A standardised system for reporting dairy effluent compliance was initiated for the 2007/08 season. This enables more accurate comparisons between the past four seasons and across regions.

4.4. In December 2011, Fonterra, the Ministry of Agriculture and Fisheries ("MAF"), the Ministry for the Environment and Local Government New Zealand published The Dairying and Clean Streams Accord: Snapshot of Progress 2010/2011. That report said that dairy cattle were at that time excluded from waterways "deeper than a Red Band gumboot and wider than a stride" on 84% of farms supplying Fonterra.

4.5. In response MAF said that the Dairying and Clean Streams Accord Snapshot of Progress Report for the 2010/11 season "shows a mixed bag of progress towards improving fresh water quality" (MAF Media release, 2011) and "...two out of five of the Accord's targets have been met, while some progress has been made towards the remaining targets" (ibid.). MAF indicated that the two targets that were met were dairy exclusion from Accord-type waterways, and bridging and culverting regular crossing points.

4.6. But later on a representative audit by MAF found that nationally, only 42 per cent of 587 farms inspected excluded stock from such waterways, just half what Fonterra's farmer survey found. It became clear that farmers have overstated the progress they had made on their farms and the difference in the results of the 2010/11 Snapshot report and independent Stock Exclusion Report shows the need for verifiable and robust third party audits of self-regulation.

4.7. From literature it is clear that achieving effective industry self-regulation is never easy and that there are a substantial number of internal and external hurdles which must be overcome before self-regulation becomes a credible policy option (e.g. Gunningham & Rees, 1997: 406).

4.8. The Accord expires in 2012. Will a potential version 2 become a credible policy option? From my perspective it can, but only if an industry morality

can be built and if responsibility can be institutionalised. Industry morality is characterised by a set of industrial principles and practices that defines the right conduct and spells out the dairy industry's public commitment to moral restraint and aspiration.

4.9. As regards institutionalised responsibility, Gunningham and Rees (1997) say that critical variables are: "...the development of industry-wide policies and procedures to ensure a strong and effective commitment to the values or ideals the industry claims to uphold, the integration of accountability and transparency in corporate (and farmer) decision making, and the capacity to 'moralise social control' and institutionalise responsibility".

4.10. The recent over reporting by farmers of their on-farm environmental protection activities indicates that the dairy industry lacks institutionalised responsibility at farmer level and that it will have to develop policies and procedures that encourage farmers to uphold industry claims about environmental protection, stewardship and its clean and green image.

4.11. There are social pressures to create a strong coincidence between the public and private interest in self-regulation by the New Zealand dairy industry (Fonterra). This increases the chances of success of self-regulation (the Accord), but adequate mechanisms must be put in place to deal with free-riders or it may still fail.

4.12. What is more, according to Gunningham and Rees (1997): "Self-regulation is very rarely successful as a 'stand-alone'' mechanism of social control. Rather, the most effective self-regulatory initiatives have involved an underpinning of government regulation, or third-party oversight, or more commonly both".

4.13. In the context of this evidence it means that version 2 of a Dairying Clean Stream Accord has to be backed by regulation and independent third-party audits.

5. THE PROBLEM OF FREE RIDING

5.1. It is clear from the evidence above that: the public wants clean fresh water and that Government is putting funding into achieving it.

5.2. It is also clear from the evidence above that dairy farmers have over reported by 50% the progress they have made with the Clean Stream Accord in terms of excluding cattle from streams.

5.3. These over-reporters are people who want to enjoy the benefits of clean fresh water without making (agreed) contributions towards it, specifically in terms of keeping their cattle out of streams. Other farmers comply while the over-reporters do not contribute but are happy share in the benefits that these other farmers create. This type of behaviour is called free riding.

5.4. Free riding is a problem associated with collective action and is a social dilemma. In short, a social dilemma is a collective action situation in which there is a conflict between individual and collective interest. In this case free riding behaviour is not a hypothetical future problem, it is a reality. It is happening already. The question is how the free riding problem should be addressed? This is discussed in the next point.

5.5. Parminter and I have agreed in our Joint Expert Witness Statement to the Environment Court on the Topic of Regulatory and voluntary approaches, dated 1/02/2012, that:

a) "A regulatory approach is appropriate for those farmers who will not take action unless they are forced to do so" (page 3). In this evidence I call them free riders.

b) "Non-regulatory policy interventions need to be designed and implemented quite strategically if they are to encourage people at each stage of change" (page 4).

c) "Rules can have a valuable role in supporting non-regulatory or voluntary methods for human and social behaviour change. Well designed rules describe clearly what is considered to be unacceptable behaviours and minimise the number of *freeloaders* and *holdouts* present in all communities". In this evidence freeloaders and holdouts are called free riders.

6. DISCUSSION AROUND AREAS OF DISAGREEMENT WITH DR PARMINTER

6.1. In our joint expert witness statement to the Court Dr Parminter and I, in paragraphs 10.1 and 10.2, point to our individual interpretations of the research of Burton et al (2008). In essence Dr Parminter contends that if Burton et al had measured different, or rather the right, attitudes or beliefs they would have come to a different conclusion. He takes a social psychological approach, which is but one of several areas of study that investigate and try to understand and explain human behaviour change and phenomena like the adoption of new technologies.

6.2. Burton et al uses the term “attitude” perhaps a bit more loosely than what Dr Parminter prefers. But that is not the issue. Burton and his co-authors’ conclusions are actually backed by many other research findings in countries like Austria (Schmitzberger et al., 2005), Finland (Herzon and Mikk, 2007), Ireland (Aughney & Gormally, 2002), Switzerland (Schenk et al., 2007), the Netherlands (Kleijn et al., 2004), and the UK (Macdonald and Johnson, 2000), as discussed in my evidence and in our joint expert witness statement to the court, dated 1/02/2012.

6.3. The way Dr Parminter argues implicitly excludes all other possibilities for understanding and explaining human behaviour. This clearly is not the case as each discipline has its own and equally relevant theoretical frameworks which attempt to explain human behaviour. I do not accept as valid an argument like Dr Parminter’s which ignores other approaches, as there is no single approach, theory or discipline that fully explains human behaviour and thinking. It is simply too complex.

6.4. In point 10.3 of our joint expert witness statement to the Court, Dr Parminter and I discussed our different interpretations regarding the research paper of May (2005). The purpose of May’s paper was to examine regulatory and

voluntary approaches regarding people's compliance behaviour. In his analysis May's logic for a regulatory approach is a criminal law model based on deterrence theory. For a voluntary approach the logic was the promulgation of best management practices (May 2005: 32).

6.5. These approaches have totally different theoretical underpinnings. The main point that May made is that one approach is not better than the other, in other words it is not a matter of "one or the other". This implies that one theory is not superior, more preferable or better than the other. May emphasises in his paper that these two different types of approaches have to be combined to get the best responses from people in terms of compliance. He recognises that they are different but equally valid theoretical foundations for explaining compliance behaviour. My evidence is consistent with May's conclusion.

6.6. Dr Parminter has exclusively used a social psychology theoretical underpinning in his analyses, evidence and interpretation and hence concluded that a voluntary approach is preferable. Social psychology underpins voluntary approaches. In his analysis, in my view, Dr Parminter has not placed enough emphasis on May's main conclusion. Despite this, we have actually agreed in our joint submission (point 9, page 5) that: "In summary, it is our view that a mix of rules and voluntary approaches are required. The rules are for a minority of recalcitrant farmers whilst it is expected that other people will respond to a well-designed voluntary strategy involving the regional council and the dairy industry working together."

6.7. Dr Parminter contends that 30 years is required in order for newly developed environmental practices to become normative on dairy farms in the Region and draws on seatbelt wearing as an example. He further contends that adequate time is needed for farmers to assess and learn the new skills associated with environmental practices.

6.8. The seatbelt example in New Zealand is the only case to draw on in terms of normative changes to happen. In my view, the differences between wearing

a seatbelt and the practice of farming are too different to draw any meaningful conclusion from for this case.

6.9. In my view, 20 years' time is sufficient for farmers to assess and learn the new skills associated with environmental practices. To ask for more time, namely 30 years, is implying that farmers are extremely slow learners and it grossly underestimates farmers' capacity to change.

6.10. Farmers can change quickly if they want to and if it is in their own interests. The use of palm kernel expeller ("PKE") is a good example of how fast they can adapt when things are in their own interest. PKE is a co-product of crude palm oil (CPO) and palm kernel oil (PKO). PKE is produced when palm kernel oil is extracted from palm kernels. It is used as a feed supplement for livestock, supplying energy and protein. According to Carlton (2011) PKE imports rose from under 5000 tonnes in 2000/1 to 1.4 million tonnes in 2010/11. Imports rose following a fairly consistent pattern for 7 years, representing an intensification of New Zealand dairy farming. In 2007/8, imports increased dramatically, almost certainly reflecting a continuation of the earlier trend combined with high milk prices in late 2007 and drought during the first (summer) months of 2008. This combination of climatic and economic factors has continued to influence demand until 2010/11 (Carlton, 2011).

6.11. In my view, if the right policy mix between voluntary and regulatory was used, 20 years is adequate for New Zealand farmers to pick up the knowledge and skills required to protect the environment, and to change accordingly.

7. CONCLUSIONS

7.1. New Zealanders want clean freshwater and prefer economic and regulatory approaches to get what they want

7.2. New Zealanders think farmers cause damage to the environment and freshwater issues are top of their mind

7.3. Residents of the Horizons Region want clean water too and Government is providing $52 million to address this issue

7.4. Regulation is part of the solution, in combination with voluntary approaches

7.5. Industry self-regulation is under suspicion because of the misrepresentation by farmers of progress with the Accord

7.6. This recent over reporting by farmers of their on-farm environmental protection activities indicates that the dairy industry lacks institutionalised responsibility at farmer level and that it will have to develop policies and procedures that encourage farmers to uphold industry claims about environmental protection, stewardship and its clean and green image

7.7. In future, industry self-regulation has to be audited by an independent external party and adequate mechanisms must be put in place to deal with free-riders or it may still fail

7.8. Free riding is an issue in collective action situations and is a social dilemma. Free riding is occurring already, as the over-reporting by farmers of progress with the Clean Streams Accord target for stream fencing shows

7.9. Dr Parminter takes a social psychological approach to his analyses, interpretation and conclusions, yet that is but one of several areas of study into human behaviour change and phenomena like the adoption of new technologies

7.10. Dr Parminter has used his rather narrow view to come to the conclusion that regulation is not required and that voluntary approaches are sufficient, given sufficient time. 30 years should be enough in his estimation

7.11. I am of the opinion that with the right combination of rules and voluntary approaches a time frame of 20 years should be sufficient to expect farmers to use appropriate farm management practices, but in the current context a time span of even 20 years is too long. Farmers can change much faster if is it is in their own interest. Since 2003, dairy farmers have had a

lead in time with the Accord to change their behaviours. There has been some progress, but it is time for change, waiting for another 20 years is too long

REFERENCES

Aughney T and Gormally M, (2002). The nature conservation of lowland farm habitats on REPS and non-REPS farms in County Galway and the use of traditional farm methods for habitat management under the Rural Environment Protection Scheme (REPS). Tearmann: Irish Journal of Agri-environmental Research 2: 1–14.

Carlton, C (2011). The carbon cost of palm kernel expeller and its contribution to the dairy carbon footprint in New Zealand. Report to Greenpeace New Zealand. Available on: http://www.greenpeace.org/new-zealand/Global/new-zealand/P3/publications/climate/2011/The%20Carbon%20Cost%20of%20Palm%20Kernel%20Expeller.pdf Downloaded 12 March 2012.

Delmas M, and Keller, A (2005). Free riding in voluntary environmental programs: The case of the U.S. EPA WasteWise program. Policy Sciences (2005) 38: 91–106.

Hughey, KFD, Cullen, R and Kerr GN. (2010). A decade of public perceptions of the NZ environment: A focus on water and its management.

Gunningham, N and Rees, J (1997). Industry Self-Regulation: An Institutional Perspective. Law & Policy, Vol. 19, No. 4, October 1997.

Herzon I and Mikk M, (2007). Farmers' perceptions of biodiversity and their willingness to enhance it through agri-environment schemes: A comparative study from Estonia and Finland. Journal for Nature Conservation 15: 10—25

Kleijn D, Berendse F, Smit R, Gilissen N, Smit J, Brak B and Groeneveld R, (2004). Ecological effectiveness of agri-environment schemes in different agricultural landscapes in the Netherlands. Conservation Biology 18 (3): 775-786.

Macdonald DW and Johnson PJ, (2000). Farmers and the custody of the countryside: trends in loss and conservation of non-productive habitats 1981-1998. Biological Conservation 94: 221-34.

Media Release (2011). Improving fresh water quality is the common goal. MAF media release, 13 Dec. 2011.

Schmitzberger I, Wrbka T, Steurer B, Aschenbrenner G, Peterseil J and Zechmeister HG, (2005). How farming styles influence biodiversity maintenance in Austrian agricultural landscapes. Agriculture, Ecosystems and Environment 108, 274–290.

Schenk A, Hunziker M and Kienast F, (2007). Factors influencing the acceptance of nature conservation measures – A qualitative study in Switzerland. Journal of Environmental Management 83 pp. 66–79.

Sinclair, D (1997). Self-Regulation Versus Command and Control? Beyond False Dichotomies. Law & Policy, Vol. 19, No. 4, October 1997

Appendix

BEFORE THE HEARINGS PANEL

IN THE MATTER OF	hearings on submissions concerning the proposed One Plan – FARMS Strategy section notified by the Manawatu-Wanganui Regional Council

STATEMENT OF EVIDENCE BY Dr Neels Botha
ON BEHALF OF FISH AND GAME WELLINGTON

INTRODUCTION

My qualifications/experience

1. My name is Dr Cornelius Alewyn Johannes BOTHA. Most people call me Neels. I am a social researcher and the social research team leader within the Agriculture and Environment (A&E) Group at AgResearch, based at Ruakura, Hamilton. I have a Bachelor's degree in Agricultural Science (The University of Pretoria), Honours and Masters Degrees in Extension and a PhD in Agricultural Extension and Rural Development (The University of Pretoria).

2. I have almost 10 years work experience with AgResearch plus the research experience gained during my employment with the University of Pretoria (14 years) and field experience as an agricultural extension officer in Namibia (8 years). My research projects focus on (i) understanding the adoption of innovations predominantly in the pastoral industry, for example new technologies or farming systems, and (ii) designing interventions and systems that encourage behaviour change. My technical speciality is in designing innovative agricultural extension systems. Much of my current research focuses on policy impact assessment and improving the impacts of research, development and extension in the dairy industry. I currently lead several Foundation for Research Science and Technology (FoRST) objectives that aim to understand and improve the adoption of technologies by the pastoral sector. I have authored more than 50 peer-reviewed publications and numerous technical reports.

3. I acknowledge the contributions to this report from my colleagues Ms Tracy Payne, a social scientist, Dr Upananda Paragahawewa an agricultural economist, and Dr Paula Blackett, a geographer and fresh water ecologist, who all work for the AgSystems group based at AgResearch, Ruakura. Tracy has 5 years research experience, Upananda has 8 years research experience including his PhD study and Paula has 10 years experience including her PhD study. They all have a strong background in the adoption of innovations and have done policy related research in the context of policy options for mitigating non-point source pollution in the pastoral sector.

4. I have read the Environment Court's practice note 'Expert Witnesses – Code of Conduct' and agree to comply with it.

My role in One Plan

5. I have not been directly involved with the development of the One Plan proposal, other than having read Ross Monaghan's section 42A evidence on behalf of Horizons Regional Council, and Fish and Game Wellington's "One Plan Overview". I also lead and was directly involved in studying the adoption by farmers of Horizon's Whole Farm Plans.

Scope of evidence

6. To establish a shared view of what "voluntary approach" means, a brief discussion is given followed by theoretical views and practical evidence of whether voluntary approaches actually work or not. Along the same lines I provide a brief discussion of the meaning of "regulatory approach" and whether it works or not. This is followed by an overview of whether it is a choice between a voluntary or regulatory approach, first from a theoretical and then from an evidence based perspective. Using evidence from Europe and Scandinavia on the use of voluntary and regulatory approaches as a basis, I emphasise in my evidence that neither voluntary nor regulatory

approaches work well on their own. The solution for improved policy impact is in getting the mix right, not in choosing the single "best" option. New Zealand research about nutrient budgets and natural resource management and farmers' attitudes about them is also briefly documented, and followed by a discussion of New Zealand (case study) farmers' concerns about changing their farming activities to become friendlier towards the environment.

EXECUTIVE SUMMARY OF EVIDENCE

7. Although scholars appear to be in two camps about the meaning of "voluntary approach" their views overlap sufficiently to say they have general consensus. But in their discussions it is clear that voluntary and regulatory are usually linked up in some way. Some authors use the well-known "carrot" and "stick" analogy to indicate that voluntary approach means that participants receive either rewards or penalties for doing the right or wrong thing. Other authors use three types of voluntary approach, based on the source and extent of action taken. The three types is unilateral action by "polluters", bilateral agreements between regulators and polluter(s) and voluntary government schemes. From a theoretical point of view, voluntary approaches can work, but only if certain criteria are met. These criteria have to do with: a credible enforcement threat that regulators can fall back on if voluntarism fails; a monitoring program, which is implemented by a respected and independent third party; and if there is peer sanction for underperformance (from Blackett 2004). However, there is now a lot of evidence from Europe which suggests that voluntary agri-environmental measures may not be effective in inducing permanent change in farmers' attitudes and behaviour. Where farmers have adopted voluntary schemes it was due to a combination of two factors, first, the action was compatible with commercial interests and second because the action required very little change to their farming system. When a regulatory approach is taken, a third party establishes acceptable farming activities (behaviours) to which farmers must comply or they will face enforcement. There are two main components of regulation, firstly the construction and application of rules, and secondly the enforcement process. Although enforcement is important, Governments often do not take lack adequate enforcement measures. A failure to meet standards must incur significant costs to the polluter, and be coupled with a high chance of getting caught. There is no evidence from literature that a regulatory approach by itself is sufficient to effectively generate behaviour change. Research has shown that there is a good case to be made for a "mixed approach" and from a theoretical perspective regulation is now seen as a "necessary aspect" of the design and use of new environmental policy instruments. Voluntary and regulatory approaches are now best thought of as ends of a continuum rather than as the sole choices. The European Union, for example, has become very reluctant to adopt voluntary agreements entirely free of a legislative superstructure. Case studies have shown that New Zealand farmers' attitude towards nutrient budgets is that it is a tool for specialists. Farmers are also disinterested in using nutrient budgets to assess potential environmental impacts of their farming activities, and they are seen as a policy requirement. Industry and local government policies help create a framework or context within which on-farm decisions are made, and these decisions are reflected in farming activities. In several New Zealand case studies it was found that industry policy actually convinced farmers to get nutrient budgets, not farmers' own volition. Partly explaining this finding, social research in the Lake Taupo catchment has described the conditions that make it hard for farmers to adopt and use environmental technologies. This and other

research have shown that farmers have some basic concerns when it comes to making changes to their farming activities and that policy development and implementation should take these concerns into account or face poor farmer responses. Stand-alone voluntary or regulatory approaches do not bring about changes in farming activities, a policy mix is required.

Evidence

What is a "voluntary approach"?

8. In literature some authors discuss two and others three types of voluntary approaches. Segerson & Miceli (1998) for example classify voluntary approaches into two types: those that induce participation by providing positive incentives; also called the "carrot" approach; and those that induce participation by threatening a harsher outcome if a voluntary agreement is not reached: the so-called "stick" approach. Other authors like Lyon and Maxwell (2002) and Rivera 2002 (cited in Moulton & Zwane, 2005) describe three types of voluntary approaches. The first type is where a single polluter or a group of polluters take unilateral action, without any regulatory involvement. With this approach the polluters themselves initiate abatement actions. Regulators do not play an active role but they can assess progress. A second type of voluntary approach is a so-called bilateral agreement between a regulatory agency and polluter or group of polluters. The terms of agreement are determined by negotiation between the regulator and the polluter(s). The polluter's obligations under these agreements generally involve certain pollution abatement activities that will be undertaken. The regulator's obligations might include: 1) a commitment not to take enforcement actions against the polluter; 2) an agreement to exempt the polluter from certain environmental regulations; 3) a commitment to provide specified financial or technical assistance; or 4) an agreement to grant a particular permit or approval for other activities. Blackett (2004) showed that environmental initiatives by industries may stem from a desire to improve environmental performance (and public perceptions), peer pressure or concern that the government may otherwise impose regulations. She argued that "initiatives can take several forms; self initiated self monitored targets, and government and business negotiated targets, government initiated targets which businesses are challenged to meet" and that "actions may be unilateral or involve an entire industry or sector". The third type of voluntary approach is a voluntary government program, under which the regulatory agency unilaterally determines the rewards and obligations from participation, as well as the eligibility criteria. This type of approach is frequently promoted in non point source (NPS) control where governments provide subsidies to encourage the (voluntary) adoption of environmental best management practices (EBP) (Dowd et al., 2008). For example, riparian planting in sensitive catchments.

Do voluntary approaches work?

9. *Theoretical perspectives:* Taplin (2004) indicates that there is a theoretical assumption that new environmental policy instruments (voluntary agreements) will have greater effectiveness and efficiency than old instruments, such as Government regulations. To start off with, voluntary approaches can only work if people actively participate in them. Individuals have to find it profitable, or worthwhile, to participate in voluntary programs (Moulton & Zwane, 2005) and this profitability can be found in active government support, co-ordination and local technical and ecological expertise (Mason et al., 2005). The effectiveness of any approach, whether it is voluntary or regulatory, is measured by the level of environmental

protection that is achieved. Apart from the number of participants, success is determined by the amount of pollution abatement undertaken by each participating polluter, and the impact that the approach has on the number of polluters (Alberini & Segerson, 2002). Hence, there is no straightforward answer to the question: "do voluntary approaches work"? As a rule of thumb Moulton & Zwane (2005) said that the most effective voluntary programs target industries whose participants value good environmental performance and provide a means for participants to credibly signal their environmental performance. According to Dowd et al., (2008) voluntary programs ought to work if: 1) there is a credible enforcement threat that regulators can fall back on if voluntarism fails, and to make this threat more credible is to structure the voluntary approach as a waiver or exemption from an already existing regulation or tax; 2) there is a monitoring program, which is implemented by a respected and independent third party; and 3) if there is peer sanction for underperformance. Hence, from a theoretical point of view, voluntary approaches can work if certain criteria are met. How do these theoretical views stack up against practical evidence?

10. *Practical perspectives:* One of the main mechanisms used in agri-environmental policy is the provision of financial rewards or penalties for performing/not performing environmental actions. In Europe, this approach formed the cornerstone of the so-called McSharry revisions to the European Common Agricultural Policy (CAP) which encouraged farmers to engage in voluntary agri-environmental schemes through government incentives. Some commentators expected major changes to result. For example Lowe et al. (1999, p. 271) asserted a decade ago that "it would reasonably be expected that there would already be discernable changes in farmers' attitudes, and even farming cultures, from participation in agri-environmental schemes". However, while these voluntary approaches schemes have been successful in terms of the amount of land entered into the programs (in 2002 over 30 million ha were covered by agri-environmental schemes in Europe), researchers in Austria (Schmitzberger et al., 2005), Finland (Herzon and Mikk, 2007), Ireland (Aughney & Gormally, 2002), Switzerland (Schenk et al., 2007), the Netherlands (Kleijn et al., 2004), the UK (Macdonald and Johnson, 2000) and other countries have found little evidence that farmers' attitudes have changed despite almost two decades of engagement. Similarly, Burton et al (2008) note that there is a lot of evidence from Europe which suggests that voluntary agri-environmental measures may not be effective in inducing permanent change in farmers' attitudes and behaviour. This is an important point because it means farmers have changed their behaviour not because they believed it was the right thing to do, or because they wanted to, but for other reasons. Where farmers have participated in voluntary schemes it was because of their own commercial interests and they did not have make big changes to their farming systems (Burton et al 2008).

What does "regulatory approach" mean and does it work?

11. Statutory regulation has been described by De Witt (1994) as "framing rules of behaviour that are applied to specific individuals or organisations through an enforcement process". Hence, in an agricultural context, when a regulatory approach is taken, acceptable farming activities are established and described in a set of rules. Farmers must comply with these rules or face enforcement. Mandatory policies, which include regulatory control, place the burden and the costs of pollution control on those who generate the pollution (Howarth, 2005). When a regulatory approach is used, farmer are required to only meet the minimum level to achieve compliance and they have no

incentive to go beyond this (Stobbelaar et al, 2009). But the approach is appropriate for those farmers who will not take action unless they are forced to (Withers et al., 2000). According to May (2005) regulations are more effective than voluntary approaches on their own, because the motivation for action relies on fears and a sense of duty to comply. Regulations can play a role in ensuring greater adoption, but caution is needed as the on-the-ground implementation of a regulation may not be the result of the regulation itself. Stream fencing, for example, was done by farmers because it made life easier for them in terms of stock management, not to enhance water quality (Bewsell et al, 2007).

12. There are two main components of regulation, firstly the construction and application of rules, and secondly the enforcement process (Blackett, 2004). Enforcement plays an important role, but compliance with many agri-environmental programs fails to meet expectations due to enforcement difficulties (Marshall, 2004). While Government can initiate rules around natural resources, they often lack adequate enforcement. Blackett (2004) has indicated that: 1) for statutory regulation to be effective it must be well and easily enforced; 2) to deter non-compliance a significant cost must be associated with failing to meet standards and; 3) if costs of non-compliance are not greater than cost of compliance or the chances of getting caught are minimal then regulation will not be successful in changing behaviour and achieving improved environmental outcomes. Sometimes policies and not effective because of how they came about and are implemented. Social aspects of the people who have to comply with the rules are very important, or run the risk of failure. Stobbelaar et al., (2009) for example argue that policy developers should attempt to get people to "make the policies their own", or to internalise them. They say that this could be done by tuning the policy instruments to the specificities of farmers' motivations. Archer and Marks 1997 (cited in Withers et al., 2000), show that experience in Europe with the Urban Waste Water Treatment Directive (UWWTD) and Nitrates Directives (ND) indicates that regulatory measures are slow and difficult to implement because of the desire for economic and social stability by participants and their ability to challenge assumptions in the courts. If these policies were better tuned to what motivate farmers, they would have been more effective.
13. In summary, there is no evidence from literature that a regulatory approach by itself is sufficient to effectively generate behaviour change.

Voluntary or regulatory approaches?

14. *Theoretical perspectives:* Research has shown that there is a good case to be made for a "mixed approach". In this regard Segerson & Wu (2006) have suggested a policy which combines a voluntary approach with a background threat of a tax or losing government subsidies if the voluntary approach is unsuccessful in meeting a pre-specified environmental goal. They indicate that the threat of regulation can be an effective mechanism for getting people to participate in voluntary agreements. Howarth (2005) argues that because the threat of regulation is such a powerful motivator for voluntary compliance, a hybrid approach is needed where regulations are part of the mix, rather than relying on voluntary programs alone. Further, Jordan et al (2003, cited in Taplin, 2004) argues that regulation is a "necessary aspect" of new environmental policy instruments' design and use. Howarth (2005) also discussed how the best solution may involve a combination of voluntary and mandatory approaches, applying different approaches to different sources of nitrogen pollution. Lyon and Maxwell (2002, p.109, cited in Dowd et al., 2008) argue that "voluntary activity is a complement to a regulation, not a

substitute", and Steelman & Rivera (2006) described voluntary programs as "valuable tools that can supplement the regulatory toolkit". May (2005, p.31) sums it up well by saying that voluntary and regulatory approaches "are best thought of as ends of a continuum rather than as the sole choices".

15. *Practical perspective:* Jordan et al (2003, cited in Taplin, 2004) showed how the European Union has been reluctant to adopt voluntary agreements entirely free of a legislative superstructure because of: 1) the suspicions or mistrust of environmentalists; 2) perceived transparency problems with voluntary agreements; 3) officials' concerns about long-term enforceability and effectiveness, and 4) some industrial actors' preference for tradition regulation because of its 'level playing field' nature.

New Zealand farmers, their farming activities and the environment

16. *Nutrient budgets*. Case studies in five catchments have shown that farmers voluntarily complied with the requirement to have a nutrient budget. Their attitude is that a nutrient budget is a tool for a specialist to use and that they did not want to get involved in developing the nutrient budget for their own farm. Nutrient budgets were done for them, but farmers retained the choice how to respond to the recommendations that were derived for them by fertiliser reps, from the budget. It was, and still is, their personal decision how they respond and what they do with the recommendations. Farmers were not interested in using nutrient budgets to assess potential environmental impacts of their farming activities. In two of the catchments, farmers regarded the need for a nutrient budget as a Fonterra requirement and not as a result of the ongoing catchment research activities in their area. It became evident that industry policy convinced farmers to get a nutrient budget rather than any altruistic desire to reduce their environmental impacts. This has shown that an understanding of the influence of industry policy or strategy, or lack thereof, on farmers is critical. In this case Fonterra's influence convinced the farmers in the study catchments to change their farming activities (behaviour). Industry and local government policies help create a framework or context within which on-farm decisions are made. Adoption (behaviour change) never takes place in a vacuum, but it happens in particular contexts. Policy (e.g. rules, regulations, incentives and disincentives) is a key part of that context. As far as encouraging voluntary change in communities or individuals is concerned, three ways of working with participants are possible: doing to, for and with. In terms of encouraging changes in on-farm activities "doing with" (i.e. partnerships) are the most effective way. Personal responsibility is important; hence building a sense of personal involvement in an issue is a good starting point in any strategy for voluntary change in environmental practices.
17. *Natural resource management.* Our research in the catchment of Lake Taupo explored the factors which affect voluntary adoption of technologies. We concluded that farmers find it hard to change their farming activities (adopt environmental technologies) when: 1) their impacts have low visibility, are hard to measure and are off-site; 2) tools to measure their effects are unavailable; 3) there is a substantial time lag between the use of the technologies and their effect; 4) farmers can't test these technologies and don't trust the science behind them, and; 5) technologies don't not line up with farmers' views of what it means to be a 'good' farmer. Any one of these factors may prevent change, but there is an inverse relationship between farmers' use of new technologies and farming practices and the number of these factors; change decreases as the number of factors increase. Several issues impacted on whether farmers' willingness to change their farming practices in the Taupo catchment study: 1) There were insufficient drivers for farmers to change their farming activities; 2) The level of responsibility that

farmers felt they had for environmental effects was low; 3) Risks associated with making rapid changes were high; 4) Farmers' lacked confidence in some of the research into new practices; 5) they did not know the financial implications; 6) Sufficient social support for change was lacking. At that time the conclusion was that, in this particular case – for farmers to sufficiently protect or enhance water quality in the Lake, extension or education wouldn't work as a standalone approach, because: education and communication activities only work for adoptable technologies; not being aware or not knowing about the problem or solutions was not an issue; farmers' lack of capacity to make decisions or choices was not an issue. The recommendation was that other policy instruments or combinations thereof should be considered, for example; incentives, disincentives, market based instruments, and regulation/rules. This research supports the notion that stand-alone voluntary or regulatory approaches would not affect farming activity changes. This and other research have shown that farmers have some basic concerns when it comes to making changes in their farming activities. Depending on the context and who the famer is, and in no particular order of importance, these concerns are described in the next point.

18. *Farmers' concerns when thinking about changing their farming activities (practices/behaviour).* Very early on in their decision-making process farmers have concerns about responsibility and duty. They want to know or be convinced that the problem is real, that it is there and that it is theirs. They want to be confident that the problem exists and that it is their responsibility and duty to do something about it, to solve it. Farmers are also concerned about evidence. They want to have the security of knowing that the solutions that are presented to them will actually solve the problem or address the issue and that it is underpinned by good unbiased research; that it is science based. That is why the visibility and measurability of the impacts of the solutions they are considering are so important to them: for most farmers, like for many other people, "seeing is believing". Farmers ask the basic question: "what's in it for me?" They are concerned about a value proposition, so they consider the perceived costs and benefits of the solution(s). Farmers firstly want to know what the implications of adopting the solution/s are in terms of lifestyle/stress and income (dollars), and then some of them are concerned about environmental impacts of the solution(s). They try to work out what will happen if they change their farming activities, and many of them need assistance with this "sorting out" process, especially when there are multiple impacts and consequences. Farmers are concerned about the full (holistic) picture. They don't separate environmental, financial and lifestyle impacts which changes in farming activities bring. When the potential solution(s) don't easily fit with their current farming system, they are concerned that adapting to and then running the adapted system may be too hard, too costly from a personal and financial perspective and too disruptive to the current farming system and activities. Some changes can be very disruptive and that really concerns them. At a personal level, farmers want to have the confidence that they have what it takes to make the required changes. They, often privately, have concerns about their own abilities and also about the personal and other consequences of failure.
19. Disregarding farmers' concerns about changing farming activities when policies are designed means that they are is highly likely to be ineffective and inefficient, whether it is voluntary or regulatory.
20. In conclusion, it is my view that Horizons regional council is on the right track, because they do not follow an "either or approach" but a policy mix.

Neels Botha
7 October 2009

References

Alberini A and Segerson K, (2002). Assessing Voluntary Programs to Improve Environmental Quality. *Environmental and Resource Economics, 22*(1), 157-184.
Aughney T and Gormally M, (2002). The nature conservation of lowland farm habitats on REPS and non-REPS farms in County Galway and the use of traditional farm methods for habitat management under the Rural Environment Protection Scheme (REPS). Tearmann: Irish Journal of Agri-environmental Research 2: 1–14.
Bewsell D, Monaghan RM and Kaine G, (2007). Adoption of Stream Fencing Among Dairy Farmers in Four New Zealand Catchments. *Environmental Management, 40*(2), 201-209.
Blackett PE, (2004). Biophysical and Institutional Challenges to Management of Dairy Shed Effluent and Stream Management Practices on New Zealand Dairy Farms. PhD Thesis. University of Auckland.
Burton, R. J. F., Kuczera, C., & Schwarz, G. (2008). Exploring Farmers' Cultural Resistance to Voluntary Agri-environmental Schemes. *Sociologia Ruralis, 48*(1), 16-37
Dowd BM, Press D and Huertos ML, (2008). Agricultural nonpoint source water pollution policy: The case of California's Central Coast. *Agriculture, Ecosystems & Environment, 128*(3), 151-161.
Herzon I and Mikk M, (2007). Farmers' perceptions of biodiversity and their willingness to enhance it through agri-environment schemes: A comparative study from Estonia and Finland. Journal for Nature Conservation 15: 10—25
Howarth RW, (2005). The development of policy approaches for reducing nitrogen pollution to coastal waters of the USA. *Science in China. Series C, Life sciences / Chinese Academy of Sciences., 48 Spec No*, 791-806.
Kleijn D, Berendse F, Smit R, Gilissen N, Smit J, Brak B and Groeneveld R, (2004). Ecological effectiveness of agri-environment schemes in different agricultural landscapes in the Netherlands. Conservation Biology 18 (3): 775-786.
Lowe PD, Ward N and Potter C, (1999). Attitudinal and institutional indicators for sustainable agriculture. In Environmental Indicators and Agricultural Policy, Brouwer F, Crabtree B (eds). CABI: Wallingford; 263–278. Lyon and Maxwell (2002) Lyon and Maxwell (2002, p.109, cited in Dowd et al., 2008)
Macdonald DW and Johnson PJ, (2000). Farmers and the custody of the countryside: trends in loss and conservation of non-productive habitats 1981-1998. Biological Conservation 94: 221-34.
Marshall GR (2004). From words to deeds: enforcing farmers' conservation cost-sharing commitments. *Journal of Rural Studies, 20*(2), 157-167.
May PJ, (2005). Regulation and Compliance Motivations: Examining Different Approaches. *Public Administration Review, 65*(1), 31-44.
Moulton K and Zwane, AP, (2005). Managing environmental risks through private sector cooperation: Theory, experience and a case study of the California Code of Sustainable Winegrowing Practices. International Food and Agribusiness Management Review, 8(4), 77-90.
Schenk A, Hunziker M and Kienast F, (2007). Factors influencing the acceptance of nature conservation measures – A qualitative study in Switzerland. Journal of Environmental Management 83 pp. 66–79.
Schmitzberger I, Wrbka T, Steurer B, Aschenbrenner G, Peterseil J and Zechmeister HG, (2005). How farming styles influence biodiversity maintenance in Austrian agricultural landscapes. Agriculture, Ecosystems and Environment 108, 274–290.

Segerson K and Miceli TJ, (1998). Voluntary Environmental Agreements: Good or Bad News for Environmental Protection? *Journal of Environmental Economics and Management, 36*(2), 109-130.
Segerson K and Wu J, (2006). Nonpoint pollution control: Inducing first-best outcomes through the use of threats. *Journal of Environmental Economics and Management, 51*(2), 165-184.
Steelman TA and Rivera J, (2006). Voluntary environmental programs in the United States: Whose interests are served? *Organization and Environment, 19*(4), 505-526.
Stobbelaar DJ, Groot JCJ, Bishop C, Hall J and Pretty J, (2009). Internalization of agri-environmental policies and the role of institutions. Journal of Environmental Management, 90 (Supplement 2), S175-S184.
Taplin RE, (2004). Australian experience with 'new' environmental policy instruments: The Greenhouse challenge and Greenhouse friendly programs. Energy and Environment, 15(3), 437-450.
Withers, PJA, Davidson, IA and Foy RH, (2000). Prospects for Controlling Nonpoint Phosphorus Loss to Water: A UK Perspective. *J Environ Qual, 29*(1), 167-175.

Our research reports:

Bewsell D, White T and McGowan A, (2008). Adoption of nutrient budgeting in the Toenepi catchment.
Botha N, Parminter T and Roth H 2006. Exploring possibilities for extension to protect water quality. Refereed paper presented at the 2006 APEN International Conference "Practice change for sustainable communities: Exploring footprint, pathways and possibilities", 3 - 6 March 2006, Beechworth, Victoria. Web site www.apen.org.au
Botha N, (2008 (a)). Barriers to the adoption of environmental technologies. Paper presented at the Environmental Forum/Worskop, LIC, Hamilton, 13-14 March 2008.
Botha N, (2008 (b)).The adoption and use of environmental technologies: insights from social research. Paper presented at the Environmental Forum/Worskop, LIC, Hamilton, 13-14 March 2008.
Botha N, Parminter T and Bewsell D, (2008). Learning from success: Adoption of Nutrient Budgeting at Rerewhakaaitu and Toenepi.
Brown M and Bewsell D, (2007). Nutrient budgeting – Report on farmer interviews. (September 2007).
Kira A, Roth H and Botha N, (2008). New Zealand dairy farming practices that may impact negatively on the environment.
Parminter T, Barrett-Ohia O and Wilson J, (2007). Adoption of Nutrient Budgeting at Rerewhakaaitu.
Roth H and Botha N, 2006. Improving water quality in Lake Taupo: Farmers' views of new land management practices. Report to FoRST.

Checklist (as per EnvCt practice note effective 31/03/05)

- □ Does body include info/facts/assumptions/tests/investigations etc considered in forming witness's opinion(s)?

- □ Does evidence list qualifications of persons who have carried out any tests/investigations referred to in evidence?
- □ Has witness stated reasons for opinions?
- □ Has witness seen Code of Conduct/are they familiar w/ it?