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NEW ZEALAND POLICY AND LAW NUTRIENT SENSITIVE ZONES - DIFFUSE POLLUTION – SECTION 30 OF THE RESOURCE MANAGEMENT ACT 1991

1. INTRODUCTION

- 1.1 As the existence of this conference demonstrates, one of the key environmental issues facing New Zealand relates to the reduction in water quality of our lakes and waterways as a result of diffuse (or non-point) discharges of nutrients (particularly nitrogen). These nutrients accelerate algal growth, which impacts on water clarity and consequently results in ecosystem degradation.
- 1.2 The operation of the natural nitrogen cycle involves a constant movement of nitrogen through the environment. In natural systems, an ongoing balance is normally achieved and a reasonable level of water quality is maintained. A significant threat to water quality has arisen from the introduction into the environment of nitrogen from anthropogenic sources, including industrial development, wastewater discharges and, predominantly, farming activities.
- 1.3 The very nature of diffuse (or non-point source) discharges poses significant challenges for regional councils which wish to address this threat to water quality, both for enforcement and in terms of regional plan and policy development.
- 1.4 In the absence of a point source discharge which can be targeted in terms of treatment or prohibition, the only obvious means of dealing with such discharges is to focus on the land uses which result in nitrogen discharges, which are capable of being identified and managed. For example, it is well known that a very significant source of nitrogen discharges to the environment is from dung and urine patches associated with pastoral and dairy farming activities, which can typically result in discharges of nitrogen as high as 60 kilograms per hectare per year (kg/N/ha/pa) into the root zones of farms, much of which then enters groundwater and subsequently surface water in rivers, streams and lakes.
- 1.5 The functions of regional councils include not only “*the control of discharges into or onto land ... or water*” under section 30(1)(f) of the Resource Management Act 1991 (“RMA”) but also “*the control of the use of land for the purpose of...the maintenance and enhancement of the quality of water in water bodies ...*” under section 30(1)(c)(ii) of the RMA.
- 1.6 Key questions which arise in this context are:
 - (a) Whether such discharges can be adequately regulated and controlled via the machinery provided in the RMA?
 - (b) If so, how should regional councils approach the issue?

- (c) What issues – legal, political or otherwise – are councils likely to face in implementing such measures?

Lake Taupo – Waikato Regional Plan Variation 5

- 1.7 Over the past eight years the Waikato Regional Council (Environment Waikato) (“EW”) has been through the process of developing and shepherding through the First Schedule process Waikato Regional Plan Variation 5 (“RPV5”). A lengthy Environment Court hearing in relation to that measure concluded in July and a decision is expected in or after September.
- 1.8 RPV5 is a complex policy and regulatory measure by which EW proposes to restore and maintain the long term water quality of Lake Taupo in light of the recognition that there has been a small but discernible decline in lake water quality in recent years, predominantly as a result of land use changes in the last 30 – 40 years – and, in particular, the development of large areas of pastoral farming which have been identified as the source of 92% of the manageable load¹ of nitrogen entering the Lake.
- 1.9 EW’s experience in developing RPV5 and the issues which needed to be grappled with in developing a workable measure provide a very good object lesson in dealing with the type of issues which arise in managing land use activities to deal with diffuse nitrogen discharges.
- 1.10 In approaching this topic, it is therefore proposed to use RPV5 as a real-life and early example of a policy and regulatory (and non-regulatory) framework designed to deal with diffuse discharges.
- 1.11 Because the Environment Court’s decision is awaited, it is not appropriate to express a view in relation to the issues which the Court needs to determine. However, most of the major elements of RPV5 are no longer disputed. Where a disputed issue is the subject of comment, commentary will be restricted to issues canvassed at the public hearing – there is no wish or intention to influence the Court beyond the submissions and evidence presented during the case.

Scope of paper

- 1.12 Specifically it is proposed in this paper to:
- (a) Outline the provisions of the RMA relevant to the regional council’s functions and to the development of regional plan provisions to deal with diffuse pollution (Section 2).
 - (b) Summarise the situation in Lake Taupo which gave rise to concerns about water quality and the need to take regulatory action (Section 3).
 - (c) Provide an overview of RPV5 focussing in particular on the policy and regulatory issues and challenges (Section 4).
 - (d) Make some general observations about lessons from the RPV5 experience which may assist other regulators (Section 5).

1 Manageable load is the total load of nitrogen leached from human generated sources (for example, pastoral farming) that can be reduced by controlling or changing land uses. An example of controlling a land use to reduce nitrogen leaching would be to require pastoral farmers to install feed pads and collect and treat the leachate from the feed pads. An example of changing a land use to reduce nitrogen leaching is converting pastoral farm land to production pine forest.

- 1.13 In making these observations about RPV5 in the context of the Lake Taupo catchment, it is important to bear in mind that the circumstances applying to the Lake Taupo situation, and caution needs to be exercised in making any assumptions as to the general applicability of the provisions of RPV5 to other catchments or situations. Indeed, a “no precedent” clause has been included in RPV5 to make that very point (and to address concerns that the RPV5 provisions would, indeed, create a precedent for other catchments). It states:

“The Objective, Policies and implementation methods contained in Variation Five – Lake Taupo Catchment have been developed to address the decline in Lake Taupo water quality in the context of the unique set of circumstances which apply in the Lake Taupo catchment. In doing so the Waikato Regional Council does not intend to create a precedent, either direct or indirect, for any other catchments or water bodies and does not consider that any precedent is created.

Issues of water quality decline in other catchments or water bodies in the Waikato Region will be investigated by the Waikato Regional Council as the need arises. If necessary, regional plan provisions and implementation methods will be developed that are appropriate for the specific circumstances of those catchments or water bodies, following appropriate community consultation and the consideration of efficiency, effectiveness, costs and benefits as required under section 32 of the Resource Management Act.”

- 1.14 Nevertheless, many of the issues which will need to be grappled with will be similar in any given case even if, ultimately, the regulatory or policy response may transpire to be quite different.

2. **LEGAL REQUIREMENTS – REGIONAL COUNCIL FUNCTIONS, POWERS AND DUTIES IN RELATION TO PLAN DEVELOPMENT**

- 2.1 We all know that there are measures available to limit discharges, such as the fencing off of streams. These type of measures can be required by district and regional plan rules or can be encouraged via non-regulatory means or voluntarily undertaken, e.g., the Clean Streams Accord². The focus of this paper is on regulatory measures which can be required via the introduction of regional planning instruments.

- 2.2 If regional councils are going to tackle the issues posed by diffuse pollution, they need to have the legal power to do so, and the ability under the RMA to promulgate the type of controls that are going to be effective in addressing those issues.

- 2.3 Any regional plan measure which is introduced to deal with diffuse pollution must meet a number of legal requirements and pass through various legal procedures. In particular, section 63(1) of the RMA states that:

“The purpose of the preparation, implementation, and administration of regional plans is to assist a regional council to carry out any of its functions in order to achieve the purpose of this Act.”

2 Dairying and Clean Streams Accord, May 2003, (“Accord”) between Fonterra Co-operative Group Limited, Local Government New Zealand, Ministry for the Environment, and Ministry of Agriculture and Forestry. The Clean Streams Accord provides a statement of intent and framework for actions to promote sustainable dairy farming by focussing on reducing the impacts of dairy farming on streams, rivers, lakes, wetlands, and groundwater. The Accord sets out a number of priorities, including ensuring that dairy cattle are excluded from streams etc, and time frames for achievement of the priorities. The Accord is available on MFE’s website.

- 2.4 The first point to note is that, to be valid, a regional plan is required to:³
- (a) Be in accordance with the Regional Council's functions as set out in section 30, the provisions of Part II, and the Regional Council's duty under section 32 (see section 66(1)); and
 - (b) Give effect to any regional policy statement (see section 67(3)(c)).

Regional Council functions – section 30

- 2.5 Section 65(1) of the RMA confers power on regional councils to prepare regional plans “for the whole or part of its region for any function specified in section 30(1)(c)”. The most relevant functions of regional councils in section 30(1) of the RMA for present purposes are as follows:

- “(1) Every regional council shall have the following functions for the purpose of giving effect to this Act in its region:
- (a) the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region:
 - (b) the preparation of objectives and policies in relation to any actual or potential effects of the use, development, or protection of land which are of regional significance:
 - (c) the control of the use of land for the purpose of
...
(ii) the maintenance and enhancement of the quality of water in water bodies and coastal water:
...
(f) the control of discharges of contaminants into or onto land, air, or water and discharges of water into water:”

Scope of regional rules – sections 65 and 68

- 2.6 The scope of regional rules are linked to these functions. Section 68(1) states that:

- “(1) A regional council may, for the purpose of—
- (a) Carrying out its functions under this Act (other than those described in paragraphs (a) and (b) of section 30(1)); and
 - (b) Achieving the objectives and policies of the plan,—
- include rules in a regional plan.”

- 2.7 In turn, section 68(5) provides that:

- “(5) A rule may—
- (a) Apply throughout the region or a part of the region:

3 *Geotherm Group Limited v Waikato Regional Council* (A 047/2006), paragraph 62.

- (b) *Make different provision for—*
 - (i) *Different parts of the region; or*
 - (ii) *Different classes of effects arising from an activity:*
- (c) *Apply all the time or for stated periods or seasons:*
- (d) *Be specific or general in its application:*
- (e) *Require a resource consent to be obtained for an activity causing, or likely to cause, adverse effects not covered by the plan.”*

2.8 Section 65(3) provides guidance as to the circumstances in which regional plans should be developed. It states:

- “(3) *Without limiting the power of a regional council to prepare a regional plan at any time, a regional council shall consider the desirability of preparing a regional plan whenever any of the following circumstances or considerations arise or are likely to arise:*
- (a) *Any significant conflict between the use, development, or protection of natural and physical resources or the avoidance or mitigation of such conflict:*
 - (b) *Any significant need or demand for the protection of natural and physical resources or of any site, feature, place, or area of regional significance:*
 - (c) *Any threat from natural hazards or any actual or potential adverse effects of the storage, use, disposal, or transportation of hazardous substances which may be avoided or mitigated:*
 - (d) *Any foreseeable demand for or on natural and physical resources:*
 - (e) *Any significant concerns of tangata whenua for their cultural heritage in relation to natural and physical resources:*
 - (f) *The restoration or enhancement of any natural and physical resources in a deteriorated state or the avoidance or mitigation of any such deterioration:*
 - (g) *The implementation of a national policy statement or New Zealand coastal policy statement:*
 - (h) *Any use of land or water that has actual or potential adverse effects on soil conservation or air quality or water quality:*
 - (i) *Any other significant issue relating to any function of the regional council under this Act.”*

- 2.9 Many of these considerations can be seen as arising in the context of diffuse pollution of waterways. Certainly subsections (a), (b), (e), (f) and (h) were seen to be relevant in the context of RPV5.

Legal basis for land use rules (section 9) and discharge rules (section 15)

- 2.10 As noted, the most effective way to deal with diffuse pollution is to address the cause of the pollution at source rather than the discharge itself. In other words, the starting point is controlling the land uses which are the source of the discharges that ultimately reach our waterways.
- 2.11 Section 9 of the RMA provides the legal basis for land use rules under the RMA and therefore needs to be seen alongside regional council functions under section 30(1)(c)(ii). The relevant part of the section states

“Restrictions on use of land

...

- (3) *No person may use any land in a manner that contravenes a rule in a regional plan or a proposed regional plan unless that activity is—*
- (a) *Expressly allowed by a resource consent granted by the regional council responsible for the plan; or*
- (b) *Allowed by section 20A (certain existing lawful uses allowed).”*

- 2.12 In turn, section 15 provides the jurisdiction to promulgate discharge rules, including discharges on to land in circumstances where they may ultimately enter water. In that regard, section 15(1)(b) states:

“15 Discharge of contaminants into environment

- (1) *No person may discharge any—*
- (a) ...
- (b) *Contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water;*
- ...
- unless the discharge is expressly allowed by a rule in a regional plan and in any relevant proposed regional plan, a resource consent or regulations.”*

- 2.13 One of the key issues which arose during the Court hearing on RPV5 (and which the Court needs to determine) is whether the rules of RPV5 were promulgated purely as land use rules under section 9 of the RMA in reliance on EW’s powers under section 30(1)(c)(ii) or whether the rules were hybrid and land use and discharge rules based on both section 9 and section 15 of the RMA which were promulgated in reliance not only on section 30(1)(c)(ii) but also on section 30(1)(f). The dispute arises from a concern on the part of national farming interests that labelling the rules as discharge rules implies that there are

discharges associated with pastoral farming activities which require resource consents. I return to this issue in Section 5.

Balancing potential effects and consequences

- 2.14 The classic conflict which arises in this context is between the need to protect our waterways while still enabling economic activities to continue, especially farming. Water quality issues arising from farming activities could obviously be addressed by curtailing that activity, but that would have severe economic and social consequences which are also highly relevant in terms of section 5 and Part 2 of the RMA (see below). Indeed, this was the most fundamental issue that needed to be addressed in the Lake Taupo situation. The requirement to undertake a rigorous consideration of alternatives and the general issues raised by Part 2 of the RMA provide a context for these “big picture” matters to be considered.

Evaluation of costs, benefits and alternatives - section 32

- 2.15 Not only do regional plan measures need to fall within the scope of the regional council functions and powers to be valid, they need to undergo a rigorous evaluation under section 32 of the RMA. Section 32(3) and (4) states that:

“32 Consideration of alternatives, benefits, and costs

(3) *An evaluation must examine -*

(a) *the extent to which each objective is the most appropriate way to achieve the purpose of this Act; and*

(b) *whether, having regard to their efficiency and effectiveness, the policies, rules, or other methods are the most appropriate for achieving the objectives.*

(4) *For the purposes of the examinations referred to in subsections (3) and (3A), an evaluation must take into account —*

(a) *the benefits and costs of policies, rules, or other methods; and*

(b) *the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules, or other methods.”*

- 2.16 The generally accepted formulation of the approach to be adopted in assessing proposed planning provisions with regard to using section 32 as a touchstone can now be found in *Eldamos Investments Limited*⁴ in the following terms:

“We... propose the following measures for evaluating objectives, and for evaluating policies, rules and other methods:

A. *An objective in a district plan is to be evaluated by the extent to which:*

4 *Eldamos Investments Limited v Gisborne District Council* (W047/05), paragraph 128. This case was recently reconsidered in the *Long Bay-Okura Great Park Society Incorporated v North Shore City Council* (A 078/2008) decision in which a number of deficiencies with the so called Eldamos test were identified.

- 1 *it is the most appropriate way to achieve the purpose of the Act (s32(3)(a));and*
 - 2 *it assists the territorial authority to carry out its functions in order to achieve the purpose of the Act (s72); and*
 - 3 *it is in accordance with the provisions of Part 2 (s74(1)).*
- B. *A policy, rule, or other method in a district plan is to be evaluated by whether:*
- 1 *it is the most appropriate way to achieve the objectives of the plan (s32(3)(b)); and*
 - 2 *it assists the territorial authority to carry out its functions in order to achieve the purpose of the Act (s72); and*
 - 3 *it is in accordance with the provisions of Part 2 (s74(1)); and*
 - 4 *(if a rule) it achieves the objectives and policies of the plan (s76(1)(b)).”*

2.17 The Environment Court has confirmed⁵ that it is appropriate to replace references to territorial authorities’ planning functions with the equivalent regional council functions. For completeness, it is noted that the *Eldamos* test was reconsidered in a recent case⁶ and a number of deficiencies were identified.

Part 2 of the RMA

2.18 Ultimately, any RMA measure is required to promote the sustainable management purpose of the RMA, as informed by the other important provisions in Part II. Section 5 sets out the purpose of the RMA as follows:

“5 Purpose

- (1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
- (2) *In this Act, “sustainable management” means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while-*
 - (a) *Sustaining the potential of natural and physical. resources (excluding minerals) to meet the reasonably foreseeable needs of future generations;*
 - (b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
 - (c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.”*

5 *Geotherm Group Limited and ors v Waikato Regional Council* (A 047/2006), paragraph 68.

6 *Long Bay-Okura Great Park Society Incorporated v North Shore City Council* - A 078/2008.

- 2.19 The correct approach to section 5(2) was recently stated by the Environment Court in the *Geotherm*⁷ decision as follows:

“Our approach is to weigh the matters in section 5(2) in order to reach a broad judgment as to whether an objective, policy, or rule would promote the sustainable management of natural and physical resources. The values in section 5 have been variously referred to as “indicators” “guidelines” “directions”, or “touchstones” for promoting the goal of sustainable management.

The matters in section 5(2)(a), (b) and (c), are all to be accorded full and equal significance. Accordingly, they are to be applied having regard to the circumstances of each case. Applying section 5 involves a broad overall judgment of whether a proposal, or in this instance, the provisions of the proposed change and variation, would promote the single purpose of the Act. This allows for the balancing of conflicting considerations in terms of their respective significance or proportion in the final outcome.”

Other Part II provisions

- 2.20 Section 6 matters must be “recognised and provided for”. Whether any of these provisions are relevant will depend on the circumstances. The matters which were most relevant in terms of RPV5 were sections 6(a), (b) and (e):

“6 Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) *The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- (b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
- ...
- (e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.”*

- 2.21 “Particular regard” must be had to section 7 matters, which include general concepts such as:

- “(a) *Kaitiakitanga:*
- (aa) *The ethic of stewardship:*
- (c) *The maintenance and enhancement of amenity values:*
- (d) *Intrinsic values of ecosystems:*

⁷ *Geotherm Group Ltd and ors v Waikato Regional Council* (A 047/2006), paragraphs 74 and 75.

(f) *Maintenance and enhancement of the quality of the environment:*

(h) *The protection of the habitat of trout and salmon.”*

2.22 The principles of the Treaty of Waitangi are also to be taken into account pursuant to section 8.

First Schedule process

2.23 Once regional rules are promulgated they must undergo a process of public notification, submissions and hearings as prescribed in the First Schedule to the RMA. It is not necessary to address this process here other than to note that it involves:

- (a) Public notification of the proposed measure.
- (b) The ability to lodge submissions seeking changes or deletion of the proposal.
- (c) Public notification of a summary of decisions requested in submissions, so that further submissions can be lodged supporting or opposing the decisions which have been requested.
- (d) The hearing of submissions and further submissions via a hearing process, including the presentation of evidence, submissions, etc.
- (e) The issuance of decisions and the right to appeal the decision to the Environment Court.
- (f) The ability to lodge appeals on points of law only to the High Court.

2.24 Needless to say, this can be a very lengthy and complex process. The First Schedule time frames applicable to RPV5 were as follows:

- (a) RPV5 publicly notified – 9 July 2005.
- (b) Submissions closed – September 2005 (136 submissions lodged).
- (c) Summary of submissions notified – 18 November 2005.
- (d) Further submissions closed 19 December 2005.
- (e) Staff report released – 12 April 2006.
- (f) Hearing of submissions – May, June and July 2006 (total of 21 hearing days). Evidence and submissions heard from 69 submitters and further submitters.
- (g) Public deliberations on evidence and submissions – July to November 2006 (total of 16 days in deliberation).
- (h) Decision released on 24 March 2007.
- (i) Period for lodging appeals expired around 14 May 2007. Nine appeals lodged by Ngati Tuwharetoa Maori Trust Board and Ngati Tuwharetoa forestry interests, Carter Holt Harvey Limited, Kaingaroa Timberlands,

Environmental Defence Society, Federated Farmers of New Zealand Incorporated, Taupo Lake Care Incorporated, and Paul Trewavas.

(j) Case management programme, including technical witness caucusing, pre-hearing conferences, and evidence exchange – June 2007 to April 2008.

(k) Environment Court hearing – May to June 2008 (18 days of hearing).

2.25 Any regional council promulgating similar provisions should probably assume similar time frames and processes applying.

3. **THE LAKE TAUPO SITUATION – OPERATION OF THE NITROGEN CYCLE AND THE NEED TO TAKE REGULATORY ACTION**

3.1 Having considered the means available to regional councils to promulgate plan provisions to address resource management issues, including diffuse pollution, and as a precursor to consideration of RPV5 itself it is proposed to comment on the situation at Lake Taupo which gave rise to the need for EW to take regulatory action.

Rationale for RPV5

3.2 Summarised in brief and simple terms, EW's concern is that development and intensification of the rural and urban land surrounding Lake Taupo has resulted in increased levels of nitrogen entering Lake Taupo from non-point sources, as a result of nitrogen leaching from the land and entering groundwater via rivers and streams and directly as groundwater inflows. Nitrogen also enters the Lake from point source discharges including stormwater outfalls, wastewater systems and the Tongariro Power Development Scheme tailrace. This increased level of nitrogen promotes algal and phytoplankton growth in the Lake, which decreases the water quality of the Lake.

3.3 EW's concern is that, if left unchecked, these nitrogen inputs would have significant adverse effect on Lake Taupo's (near) pristine water in the future. In essence, RPV5 was developed to maintain the long term water quality of the Lake by addressing discharges to Lake Taupo from manageable (i.e., human induced) sources, it not being possible to address nitrogen from unmanageable (natural) sources.

Operation of the Nitrogen Cycle in the Lake Taupo catchment

3.4 More appropriately qualified speakers at this conference than I are addressing scientific issues relevant to the nitrogen cycle. It is only proposed here to put the nitrogen inputs into Lake Taupo into context.

3.5 It was necessary in the context of the RPV5 hearing to address the operation of "the Nitrogen Cycle" as it operates in the catchment in considerable detail. In order to put that evidence into context, EW's Water Quality scientist, Bill Vant, prepared an overview of the nitrogen cycle for the Lake Taupo catchment, i.e., the manner in which nitrogen moves through the environment and which was presented in a re-formatted form as part of Opening Submissions. In order not to spend too much time on this issue, Mr Vant's appendix has been reproduced as **Appendix A** to this paper, with straightforward diagrammatic representations below. In brief summary, it is clear that there are a number of human induced sources of nitrogen to the Lake which as a result can be managed (unlike, for example, nitrogen inputs from the rotting of native bush) and, therefore, that represents an opportunity to reduce nitrogen discharges by managing those sources.

Nitrogen budget

- 3.6 A nitrogen budget initially developed for the Lake by EW estimated that at the year 2000, 1220 tonnes of nitrogen was entering the Lake on an annual basis, of which approximately 650 tonnes represented the pre-development load from unmanageable natural sources and approximately 468 tonnes was from human induced manageable sources. It is estimated that 92% of the nitrogen entering the Lake from manageable sources arises from pastoral farming within the Lake's catchment.

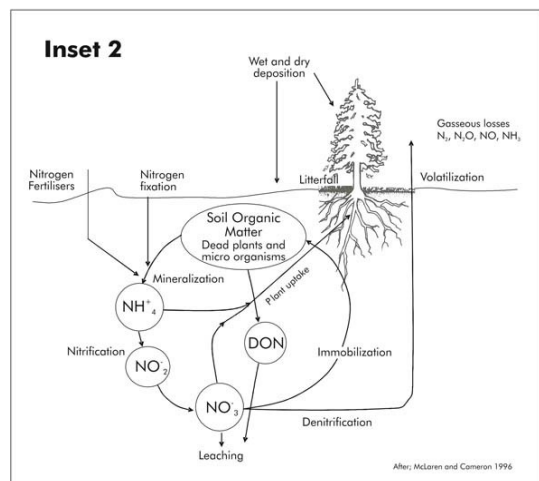
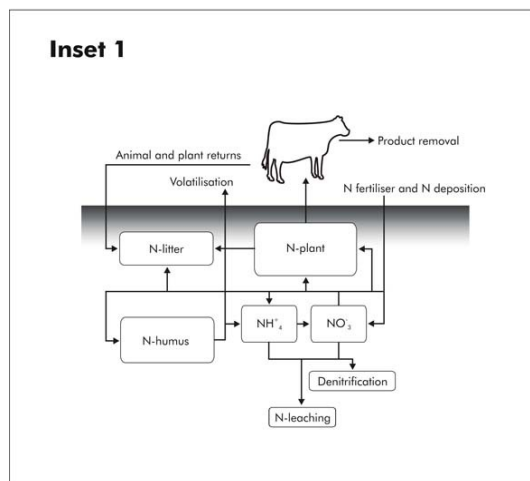
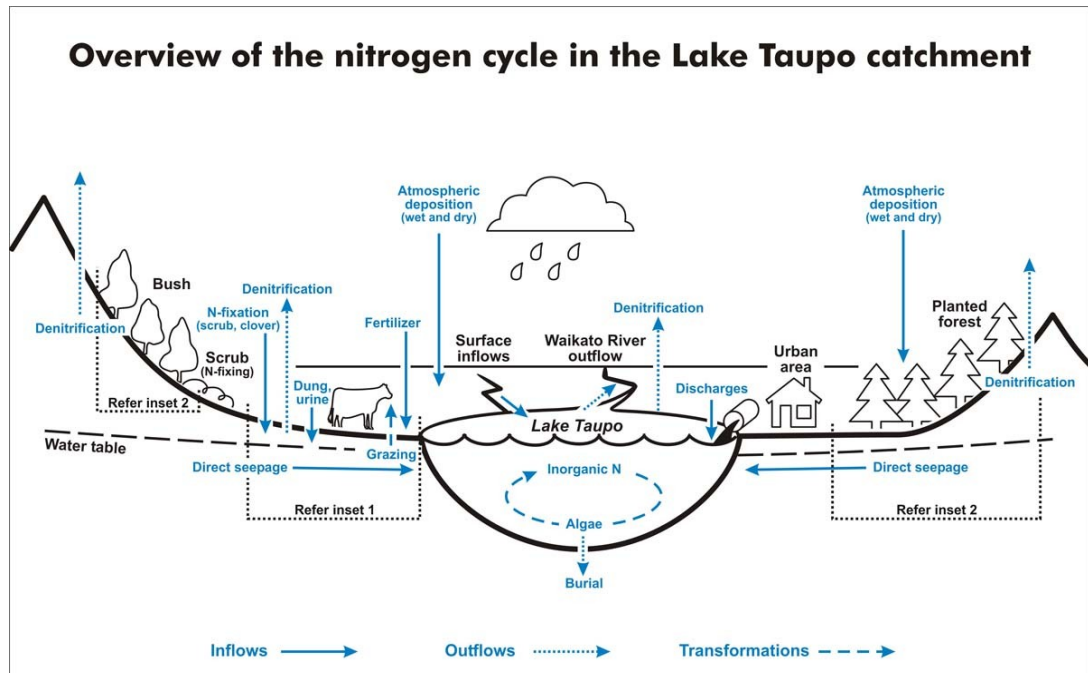


Figure 1: The nitrogen cycle in the Lake Taupo catchment.

- 3.7 The total and manageable loads of nitrogen entering the Lake were revised as a result of caucusing between technical experts for EW and some of the appellants. An Agreed Science Statement was prepared, signed by the technical experts, and filed with the Court. The revised figures in the Agreed Science Statement for the total and manageable loads were as follows:

- (a) Total load – 1300 to 1320 tonnes per year.

- (b) Manageable load – 535 to 555 tonnes per year.
- 3.8 These figures were further refined in Mr Vant's rebuttal evidence as a result of new information on leaching rates from non-farming land uses (pine forest, etc.) as follows:
- (a) Total load – 1357 tonnes per year.
 - (b) Manageable load – 543 tonnes per year.
- 3.9 There is a substantial time lag (many decades in some cases) between nitrogen leaching from the land and it eventually entering the Lake. The upshot is that holding nitrogen discharges at current levels would not maintain water quality. Following the lodging of appeals, a key issue that was caucused very early between expert witnesses was the size of the load of nitrogen yet to be discharged to the Lake before equilibrium is reached (referred to as the "load to come"). The expert witnesses estimated this as between 160 and 230 tonnes per year and these figures were included in the Agreed Science Statement.
- 3.10 During the hearing these figures were further refined as a result of more technical witness caucusing to between 163 and 238 tonnes per year.

4. LAKE TAUPO VARIATION – OVERVIEW

- 4.1 Having identified the issue which had arisen in relation to the threat to the long term water quality of Lake Taupo, EW staff embarked upon an exercise of identifying what response the community demanded or desired in these circumstances, i.e. whether the water quality should be improved, should be managed in order that they remain the same or not to take any action. As a result of an extensive consultation exercise involving the circulation of a pamphlet to regional ratepayers and a number of public meetings. EW was able to ascertain that the regional community did not want to ignore the issue, but nor did they want to invest the resources to actually improve the water quality of the Lake – given that it is very high in any event.
- 4.2 Key aspects of the background to RPV5 can be broadly summarised as follows:
- (a) Scientific recognition of the issue.
 - (b) Reports were commissioned in regard to the potential for large scale land conversion in the Lake's catchment, particularly dairy conversions.
 - (c) EW notified key stakeholders (the Crown, Taupo District Council, farming groups, Ngati Tuwharetoa etc) of threats to the water quality of the Lake and its intention to take action in late May 2000.
 - (d) EW published a pamphlet for landowners and interested parties entitled 'Protecting Lake Taupo - A Plan by Environment Waikato'. The pamphlet focused on nitrogen as the source of the water quality issue, actions that would limit nitrogen leaching, economic benefits of a clean Lake and the threat to water quality in the Lake of wide-scale conversion to dairying in the catchment.
 - (e) Public meetings were held at Taupo and Tokaanu in early 2000 then again in November the same year.
 - (f) In September 2000 a paper entitled "Issues and Options for Managing Water Quality In Lake Taupo" was prepared and circulated amongst stakeholders and the general public, seeking feedback on four different

options for Lake water quality – better water quality, maintain water quality, slightly lower water quality, and do nothing.

- (g) During 2001, in a Council resolution, EW decided to pursue Option 2 – maintain current water quality in Lake Taupo – by reducing nitrogen output from existing land uses and preventing further intensification.
 - (h) Numerous surveys were carried out to determine people’s attitudes to maintaining water quality.
 - (i) Meetings and consultation with the Ngati Tuwharetoa Maori Trust Board, Ngati Tuwharetoa forestry and farming interests, Taupo Lake Care Incorporated, Lakes and Waterways Action Group, forestry groups, Taupo District Council, and the Ministry for the Environment.
 - (j) Development of the 2020 Taupo-nui-a-tia Action Plan in association with Taupo District Council, Lakes and Waterways Action Group, and Ngati Tuwharetoa. The 2020 Taupo-nui-a-Tia Project aimed to clarify the roles and responsibilities of the different agencies and management groups involved in managing the Lake, and develop a process to identify the key values for the catchment. The project then went on to identify key ‘new actions’ to help protect and enhance those values which had been identified.
 - (k) Discussions with the Crown and Taupo District Council in regard to establishing and funding a trust to permanently remove nitrogen from the Lake Taupo catchment.
- 4.3 EW also closely assessed options available to achieve EW’s objectives, including a comprehensive section 32 analysis.
- 4.4 Having considered the options open to it to address the issue and discussing the matter at some length with its partners in the project – the Crown, Waikato District Council, Taupo District Council and Ngati Tuwharetoa – EW decided to pursue a combination of regulatory and non-regulatory means for addressing the issues by:
- (a) Controlling further land use intensification, thereby preventing an increase in the amount of nitrogen leached from existing land uses beyond that which was occurring in 2001 (known colloquially as “the nitrogen cap”).
 - (b) Permanently reducing the nitrogen discharged from existing farming land uses and wastewater by 20% to offset the load to come (known colloquially as the “nitrogen reduction target”).
- 4.5 It would theoretically have been possible to require farmers to reduce their discharges of nitrogen. However, the decision to adopt this two-pronged approach was to avoid a situation in which existing farmers would have to achieve actual reductions in nitrogen discharges associated with pastoral farming activities which would necessarily impact on farming operations and thus generate adverse social and economic effects, not only for the farmers but for the broader community.
- 4.6 The implementation of the regime for benchmarking nitrogen discharges, establishing NDAs, approving NMPs and overseeing trading requires a complex legal regime within which to operate. In that regard, RPV5 represents a highly complex suite of provisions. It is now proposed to provide an overview of the provisions.

Overview of RPV5

- 4.7 The strategy being implemented to achieve the objective of maintaining the water quality of the Lake involves a two-pronged approach comprising both regulatory and non-regulatory mechanisms. These can be summarised as follows:
- (a) A regulatory component involves the promulgation of objectives, policies and rules via RPV5, the principal purpose of which is to achieve a cap on nitrogen discharges to the Lake from the catchment at historical (2001 - 2005) levels.
 - (b) A non-regulatory component (although recognised and provided for in RPV5), involves the establishment of a Public Fund to permanently remove 20% of the manageable nitrogen leaching from pastoral farming and wastewater in the catchment.
- 4.8 Both mechanisms seek to achieve the objectives of RPV5, especially Objective 1 which seeks to maintain the 2001 water quality of the Lake by 2080 as indicated by the following:

Water Quality Characteristic	Mean	Standard Deviation
Total Nitrogen (mg/m ³)	70.3	19.1
Total Phosphorous (mg/m ³)	5.57	1.4
Chlorophyll a (mg/m ³)	1.18	0.6
Secchi depth (m)	14.6	2.7

Key provisions

- 4.9 RPV5 introduces rules to achieve the cap on nitrogen discharges from existing land uses within the catchment of the Lake. The summary below reviews RPV5 as at the commencement of the Environment Court hearing in May 2008. Given that the Court has to make decisions in relation to the final form of RPV5, it is not appropriate to refer to amendments that were agreed to by the parties over the course of the appeals hearing, nor is it necessary to do so for present purposes.
- 4.10 Rules 3.10.5.1 to 3.10.5.5 relate to nitrogen leaching land uses.

Rules 3.10.5.1 to 3.10.5.5 - Nitrogen leaching land uses

- 4.11 Rule 3.10.5.1 provides for low nitrogen leaching farming activities as permitted activities.
- 4.12 Rule 3.10.5.2 provides for nitrogen leaching non-farming activities as permitted activities. The rule permits planted production forestry activities and other 'non farming activities'. This rule includes conditions for the use of fertiliser on planted production forestry land.
- 4.13 Rule 3.10.5.3 is a central provision. It provides, as a controlled activity, for high nitrogen leaching farming activities, i.e., operations which involve more stock than the very low stocking rates set out in permitted activity Rule 3.10.5.1.
- 4.14 Farming interests argued strongly that farming should be a permitted activity due to sensitivity that pastoral farming per se might need a resource consent (as distinct from specific discharges, e.g., irrigation of dairy shed effluent, which

already need resource consents). This is an issue which the Court will need to determine.

- 4.15 The cap on nitrogen discharges is to be achieved by using the OVERSEER® nutrient budget computer model to “benchmark” existing nitrogen discharges from farming operations. As per EW’s decision, it was proposed that the benchmark will be based on the average annual amount of nitrogen leached from a farm between July 2001 and June 2005. However, EW agreed to amend this approach to allow the use of the single best year within the benchmarking period. This becomes the nitrogen discharge allowance (or “NDA”) for that farm.
- 4.16 The farming operation needs to be undertaken in accordance with a nitrogen management plan (“NMP”) prepared by the farmer and approved by EW.
- 4.17 Once the benchmark level is set, the farmer then produces a NMP to describe farm practices which will ensure that the NDA is complied with. This has to be approved by EW. Major changes to farming operations require the preparation of a new NMP and verification, via further use of the OVERSEER model, that the benchmarked NDA is not being exceeded. The reasoning behind this approach is to assist EW in ensuring that the overall nitrogen cap for the whole catchment is not exceeded.
- 4.18 Pastoral farmers are entitled to continue to leach nitrogen at historical levels on the basis that EW does not wish to assign “blame” to these landowners, and to maintain the status quo. Landowners who were not farming as of the date of notification of the rule can only farm (or in fact undertake any activity which leaches more nitrogen than historically occurred on their land) as a controlled activity if they can obtain a nitrogen offset for any increase in nitrogen leaching from their land. They would otherwise require a non-complying activity consent.
- 4.19 It is contemplated that any allocated nitrogen leaching capability (represented by their NDA) which a consent holder does not require (through increased efficiency, alteration to land uses, etc.) will be able to be traded within the catchment. RPV5 contains provisions relating to trading or “offsetting” nitrogen which provide guidance as to how nitrogen leaching allowances can be redistributed between properties. For example, if an existing farmer were to convert their land to lifestyle blocks which would discharge far less nitrogen than pastoral farming operations, the excess NDA entitlement could then be sold or leased to a farmer who wished to intensify farming operations.
- 4.20 Rule 3.10.5.4 provides for nitrogen discharges from new nitrogen leaching land uses (provided those increases are offset elsewhere in the catchment) as controlled activities.
- 4.21 Rule 3.10.5.5 provides for land uses activities that do not meet the preceding rules as non-complying activities.
- 4.22 Viewed in the round, the effect of Rules 3.10.5.1 to 3.10.5.5 is to retain the status quo with respect to nitrogen leached from land uses within the Lake’s catchment. This means, for example, foresters can continue to carry out their forestry businesses and farmers can continue to farm at the intensity/scale that they have in the past. The rules are designed to limit any increase in nitrogen leaching in the absence of compensatory nitrogen leaching offsetting as that would result in the nitrogen cap being exceeded. In this way, historical land uses are grandparented.

Rule 3.10.6 - Wastewater rules

- 4.23 RPV5 also introduced sophisticated and complex provisions relating to wastewater discharges in the Lake Taupo catchment. They relate to:
- (a) Existing on-site wastewater discharges in the near-shore zone as permitted activities (Rule 3.10.6.1).
 - (b) Existing on-site wastewater discharges outside the near-shore zone as permitted activities (Rule 3.10.6.2).
 - (c) New advanced on-site wastewater discharges on properties greater than 5,000 square metres (or 2,500 square metres if subdivision consent is granted before 9 July 2005) as permitted activities (Rule 3.10.6.3).
 - (d) New conventional on-site wastewater discharges on properties greater than 4 hectares as permitted activities (Rule 3.10.6.4).
 - (e) New papakainga and marae wastewater discharges as restricted discretionary activities (Rule 3.10.6.6).

Public Fund and Lake Taupo Protection Trust

- 4.24 EW engaged with Central Government and Taupo District Council in relation to implementing land use change, including funding options, to achieve a 20% reduction in the manageable nitrogen inputs to the Lake. As a result, a joint public fund has been established to permanently remove 20% of the manageable nitrogen from the catchment through securing permanent change on individual properties to a lower nitrogen leaching land use. It is contemplated that this will be achieved by either purchasing pastoral and cropping land in the Lake's catchment from willing sellers and converting it permanently to covenanted low nitrogen land uses (such as forestry) or purchasing the NDAs from willing landowners and permanently removing that nitrogen from the catchment.⁸
- 4.25 The Public Fund is vested in the Lake Taupo Protection Trust, a council controlled organisation that has been established pursuant to the provisions of the Local Government Act 2002 and a deed of Trust between the Crown, the Regional Council, and Taupo District Council.
- 4.26 The policy of reducing manageable nitrogen inputs to the Lake by 20% by the year 2020 is also included in RPV5.

5. KEY LEGAL AND POLICY ISSUES – DISCUSSION

- 5.1 Against that background, it is proposed to identify some of the key issues which arose or needed to be considered in the development of RPV5, to see whether there are any useful lessons which can be drawn from the exercise and taken into account in other catchments.
- 5.2 As noted, I am constrained in some respects by the fact the Environment Court still needs to make a decision in relation to appeals on RPV5. Having said that, there is now a large measure of agreement in relation to the key elements of RPV5 so that most aspects of the variation are effectively settled to the extent that the provisions were not subject to appeal or agreement has been reached. Where an issue that warrants comment still needs to be determined by the Court, any comments will be confined to matters that were put before the Court at the public hearing.

8 Page 38 of the section 32 analysis dated March 2007.

- 5.3 The most important issue that is likely to need to be grappled with elsewhere is the issue of “allocation”, so my comments will focus on that issue. Other issues are:
- (a) Whether nitrogen discharges associated with plantation forestry should be regarded as manageable load and given entitlement via the benchmarking process.
 - (b) Planning issues (largely relating to activity status).
 - (c) Legal issues, relating to the legal basis for the rules.
- 5.4 All three of these issues still need to be determined by the Court and will therefore be the subject of only brief comment.

“Allocation” – grandparenting versus averaging or regulation

- 5.5 One of the key issues which EW had to grapple with when developing RPV5 was to arrive at a means of reducing man-made nitrogen discharges into the Lake Taupo catchment nitrogen cycle while balancing potentially adverse social and economic effects. It was a fear of causing such effects that led EW to favour a system whereby a “cap” would be achieved by restricting farming activities so there will not be any increases in nitrogen discharges without actually forcing farmers to reduce their discharges.
- 5.6 In that regard, EW was acutely aware in developing RPV5 of the need to appropriately balance environmental objectives in terms of the Lake (and the social and economic benefits associated with its pristine quality and iconic status) alongside the cultural, economic and social consequences associated with managing nitrogen discharges. In that regard, a key objective (Objective 4) of RPV5 is that:

“Economic costs of managing land use activities to achieve Objective 1 are minimised, and spread across local, regional and national communities. Social and cultural effects of managing land use activities to achieve Objective 1 are mitigated.”

- 5.7 The explanation to that objective states:

“Objective 4 recognises that intervention managing land use activities to achieve Objective 1 could make some existing rural land uses unviable if they were required to achieve reductions in nitrogen, leaving many people in financial hardship. If no action is taken to reduce the impact on particular sectors of the community, there will be significant adverse social, cultural and economic effects on those sectors. Flow-on effects to the wider community, such as decline in local business, may also result. The objective seeks to minimise these impacts and ensure costs are spread across local, regional and national communities. The objective also creates an expectation of a higher level of involvement in managing change between the regulatory authority and affected landowners than has historically occurred.”

- 5.8 Against that background, a fundamental philosophical underpinning of RPV5 is that farmers should be entitled to continue to carry on farming operations at the same level as they have historically undertaken – this level of activity being the “grandparented” entitlement. Any land use intensification must be achieved without affecting the overall nitrogen cap for the catchment. Farmers may intensify their operations without increasing nitrogen leaching by taking up new nitrogen management practices or by acquiring nitrogen from other landowners in

the catchment who have generated surplus nitrogen by changing land use practices.

- 5.9 To that extent, the grandparenting approach recognises that existing farms and the plant and buildings on them represent the outcome of significant effort of individuals and families and significant investment in assets and infrastructure which represent “physical resources” that must be sustainably managed in terms of section 5 of the RMA. EW gave a great deal of consideration to these matters in developing RPV5, whilst being very clear about the need to preserve the Lake’s water quality.
- 5.10 It is also important in that context to note that EW was not and is not seeking to assign “blame” for historical contamination of the Lake as a result of what were considered to be lawful and appropriate farming activities. In particular, it was not known at the time they were established that these activities (many of which were encouraged and even subsidised by Central Government) were having (or eventually would have) adverse effects on water quality.
- 5.11 It is for that reason that RPV5 seeks to achieve the 20 percent reduction in pastoral farming (manageable load) nitrogen discharges via the application of the Public Fund by the Trust, rather than imposing an initial nitrogen discharge allocation regime that would require farmers to reduce their nitrogen discharges. Those discharges, in the context of RPV5, represent a reasonable proxy for farmers’ efforts, recognising that an actual reduction in the ability to carry out normal farming activities (and the nitrogen discharges associated with them) would cause significant social and economic dislocation which cannot be justified when more equitable and practical alternatives exist.
- 5.12 This was a key reason why any kind of allocation regime based on averaging (which carries a punitive element as far as existing farmers are concerned) was not favoured by EW and it remains the principal basis for EW’s opposition to such an approach.
- 5.13 Although the relief was abandoned during the hearing, one of the key appellants to RPV5, Carter Holt Harvey Limited (“CHH”) requested the implementation of a different regime for limiting nitrogen discharges, namely:
- (a) Delayed averaging; or
 - (b) Alternatively, regulation without allocation or trading.

Delayed averaging

- 5.14 Under delayed averaging as proposed:
- (a) An average value of nitrogen which may be leached, expressed in kilograms per hectare per year, would be derived for the entire catchment, (excluding Department of Conservation land)
 - (b) There would be no cap, allocation, or trading of nitrogen until 2015, which is when a cap would be imposed, allocation based on catchment-wide averaging would occur, and nitrogen trading would commence.
 - (c) From 2015 landowners in the catchment would not be permitted to undertake activities which would result in nitrogen discharges which exceed the catchment-wide average allocation unless they purchased or leased nitrogen credits from a person with a surplus of nitrogen credits.

- (d) Prior to 2015, farmers would be required to implement activity standards (or what are more commonly known as management practices) designed to minimise nitrogen discharges, and foresters wanting to convert to farming could do so provided they complied with the same activity standard rules as farmers.

5.15 CHH supported delayed averaging for a number of reasons, including the following:

- (a) It treats all land owners in the catchment equitably as they would all be allocated the catchment wide average nitrogen leaching rate.
- (b) It provides for foresters to convert from forestry to farming or any other land use prior to 2015 provided that they meet the regulated “activity standards” or farming management practices and is, therefore, more consistent with the philosophy of having the freedom to exercise property rights so as to make profits in response to market signals.
- (c) As past “polluters”, farmers should be required to implement management practices to reduce nitrogen leaching so that they “trend down to” the catchment wide average prior to it being imposed.
- (d) Grandparenting is inconsistent with the polluter pays principle.
- (e) Grandparenting would set a precedent for other catchments.
- (f) Given alleged scientific uncertainties (root zone leaching rates from land uses in the lake Taupo catchment, loads to the Lake, and accuracy of OVERSEER) underpinning RPV5, delayed averaging is preferable because it delays the implementation of capping, allocation, and trading and thereby provides time for more research and analysis.

5.16 Both EW and farming interests vehemently opposed delayed averaging as a means of allocating rights to discharge nitrogen, for a variety of reasons:

- (a) At a philosophical level it is possible to argue that both grandparenting and delayed averaging are equitable. However, when the implications of grandparenting versus delayed averaging are considered, grandparenting is to be preferred both as regards EW’s goals in terms of water quality in Lake Taupo and having regard to social and economic consequences – both highly relevant in achieving the purpose of the RMA.
- (b) In allowing historical land uses to continue at the same intensity, but no greater unless nitrogen trading or offsetting occurs, grandparenting imposes an opportunity cost on all landowners as it places limits on what otherwise might have been the development potential of land in the catchment. To that extent, farmers and foresters are treated equally.
- (c) By contrast, delayed averaging would result in a significant transfer of nitrogen credits (wealth) from farmers to foresters in 10 years time (as farming leaches much more nitrogen than forestry in the catchment) with the result that farmers would not be able to continue farming at historical levels unless they could purchase nitrogen credits to do so. This results in a significant transfer of wealth as existing operators seek to obtain credits and this creates windfall gains for the owners of forested and undeveloped land.

- 5.17 Ultimately, the matter did not need to be determined, but the issue may well arise again in other catchments. It is important to note that the relative merits of averaging versus grandparenting will be influenced by the pattern of land use in the catchment.

Regulation without allocation or trading

- 5.18 This would involve the imposition of a regulatory regime whereby farmers farm pursuant to a controlled activity consent that requires them to implement on-farm management practices to minimise nitrogen leaching. The regulatory regime would also allow foresters to convert to farming and comply with the same requirements as farmers.
- 5.19 EW was opposed to this relief on the basis that specific nitrogen abatement practices which are uniformly applicable across all landholders will have varying effectiveness and costs amongst different landowners. It would not cap nitrogen discharges, would allow intensification of land use in the catchment as foresters would be entitled to convert to farming land use, and the management practices proposed are ineffective, impractical, and uneconomic in the Lake Taupo catchment.⁹
- 5.20 Again, the matter did not need to be determined but may well be an issue in another catchment, in which case the specific measures available and their likely effectiveness would need to be considered.

Auctioning

- 5.21 Auctioning as a means of allocating nitrogen discharge allowances was also raised but this was not pursued.

Grandparenting with flexibility

- 5.22 As a footnote to the discussion in relation to allocation, it is worth noting that a variation on the grandparenting philosophy has been introduced to meet the specific needs of Ngati Tuwharetoa, who are the largest landowner in the catchment. Historical factors have limited their ability to develop their land so most of it remains undeveloped and it was seen as appropriate to enable some flexibility to recognise these factors provided that it does not result in any more than a minor effect on the cap. Of particular importance is that the effect of providing this flexibility will have only a minor effect on the cap and small effect on Lake water quality if all of the potential development opportunity is realised.

Dealing with forestry leaching

- 5.23 When RPV5 was notified, forestry was assigned a leaching rate of 2kg N/ha/pa and that figure remained the same in the Decisions Version of RPV5. Part of the CHH appeal alleged that this figure was too low.
- 5.24 EW commissioned a team of experts to further consider this issue in light of the available literature and data primarily derived from the Puruki Pine forest in the Purukohukohu experimental catchment outside of the Lake Taupo catchment. As a result of this process, it was acknowledged that the leaching rates for pine forests planted into improved pasture and nitrogen fixing species such as gorse, broom, and tutu, were higher than 2 kg N/ha/year. It was also acknowledged that nitrogen leached from pine forest planted into improved pasture is manageable as there are management practices that can be used to reduce the leaching rate.

9 Ledgard EIC, section 9 and rebuttal, paragraphs 3.17 and 3.19.

- 5.25 The experts agreed that the best estimate for the leaching rate of nitrogen fixing scrub is 23 kg N/ha/year, but they could not agree on the final figures for pine forest planted into improved pasture. Ultimately, this became a significant issue in terms of the evidence that had to be prepared and the hearing time that was required for that evidence to be presented, even though the range of difference was only 8 kg N/ha/year (EW experts) versus 12 kg N/ha/year for pine forests planted into improved pasture and the amount of such land in the Lake Taupo catchment is very small. There was also disagreement amongst the experts in relation to how long it takes for the leaching rate to trend down to a background level of 3 kg N/ha/year.
- 5.26 CHH have argued that forestry leaching should be dealt with by providing a deemed leaching rate of 12 kg N/ha/year for pine forests planted into improved pasture. The primary reasons for that position are as follows:
- (a) It reflects a grandparenting approach that is consistent with how pastoral farming is proposed to be treated and reflects the amount of nitrogen likely to be leached from the land.
 - (b) It may take hundreds of years for the leaching rate to trend down to background levels of 3 kg N/ha/year.
 - (c) Assigning the deemed background leaching rate allows an offset which would allow farmers to increase stock numbers and, therefore, nitrogen leaching.
- 5.27 EW, Ngati Tuwharetoa and the farmers in the catchment have argued that pine forests planted into improved pasture should be given a deemed leaching rate of 3 kg N/ha/year. The primary reasons for that are as follows:
- (a) The leaching rate will trend down to this background level over 2 to 5 rotations.
 - (b) It provides an incentive for farmers to convert pasture to pine forest.
 - (c) It avoids locking in a high leaching value.
- 5.28 This is an issue which the Court is required to determine and which will be addressed in its interim decision.

Activity status

- 5.29 A key issue which attracted a great deal of attention throughout the hearing was whether high nitrogen leaching farming activities under such a regime should be a permitted activity, commensurate with farmers' views that no resource consents should be necessary to undertake farming activities, or a controlled activity, as favoured by EW.
- 5.30 Farmers argued that farming activities should be accorded permitted activity status, largely on the basis of a philosophical position that they should not be required to obtain resource consents to undertake farming activities and because it is possible to craft permitted activity rules that enable nitrogen discharges to be controlled. A draft permitted activity rule was prepared as a result of caucusing. The rule contains detailed standards, conditions, and terms as it has to be a self contained rule with the required degree of certainty that sets out all of the necessary steps to benchmark a farm and ensure compliance on an ongoing basis. The rule covers 5 pages of A4 paper at single spacing and is the most draconian permitted activity rule I have ever seen. The rule was agreed to by the farmers and their planning consultant, albeit with some reservations about the

legality of certain matters included in the standards, conditions, and terms of the rule.

5.31 EW does not support the permitted activity rule and favours a controlled activity rule on the basis that it is a much simpler approach and the actual rule is extremely succinct compared to the permitted activity rule. Further, EW's position is that the controlled activity rule enhances regulatory certainty and provides EW with a degree of flexibility to deal with the realities of farming in the Lake Taupo catchment. In addition to these matters, there are legal issues with the permitted activity rule in terms of certainty, comprehensibility, discretion being reserved to EW, and the ability to recover the fair and reasonable costs of monitoring under a permitted activity regime.

5.32 This is an issue which is likely to arise anytime this matter needs to be addressed.

Legal basis for rules

5.33 One of the key issues which arose during the Court hearing on RPV5 (and which the Court needs to determine) is whether EW was developing purely land use rules under section 9 of the RMA promulgated in reliance on section 30(1)(c)(ii) or whether the rules were hybrid land use and discharge rules based on both section 9 and section 15 of the RMA and promulgated in reliance not only on section 30(1)(c)(ii) but also on section 30(1)(f).

5.34 EW considers that the rules of RPV5 were developed in reliance on both section 9 (land use) and section 15 (discharge) of the RMA, due to the need for discharges to be "expressly allowed" in terms of section 15. However, national farming interests are concerned that they be labelled land use rules only, lest the implication be raised that pastoral farming activities involve discharges from stock that need to be authorised in terms of the RMA.

5.35 As a result of that concern, farming interests made extensive arguments that the RPV5 rules as notified were land use rules only, that the Court has no jurisdiction to make the rules hybrid land use and discharge rules, discharges from stock are not discharges within section 15(1)(b) of the RMA, and, in any event, it is not necessary to have hybrid rules as rules promulgated pursuant to section 9(3) of the RMA authorise any associated discharges of nitrogen.

5.36 EW's position is that there is an argument based on existing case law that discharges from stock are discharges within section 15(1)(b) and is concerned to ensure that the rules of RPV5 expressly authorise those discharges. In relation to the other arguments presented by the farming interests, EW's position is that the Court has jurisdiction to determine that the rules are hybrid land use and discharge rules, the public notice for RPV5 made it clear that the rules were always intended to be hybrid land use and discharge rules, the notified version of the rules may only authorise discharges by implication (rather than expressly as required by section 15(1)(b)), and that it is necessary for the rules to be hybrid rules that expressly authorise discharges, particularly given that a Court may decide in the future that discharges from stock are discharges within section 15(1)(b).

5.37 The Environment Court has yet to rule on this issue so it is not appropriate to take the point any further at this point. However, it is probably safe to say that, in the absence of a ruling that diffuse discharges can be adequately authorised as a pure land use under section 9, it represents good practice for regional councils to assume that any rules dealing with discharges via urine and dung patches, etc., should be based on or referenced to both section 9 and section 15 of the RMA.

6. CONCLUDING COMMENTS

- 6.1 As noted, care needs to be taken in transferring the specific lessons from EW's RPV5 experience to other catchments, on the basis that the regime which is adopted to deal with "allocation" and the appropriateness of a specific rule regime will be heavily dictated by the pattern of land use in the relevant catchment and important socio-economic considerations.
- 6.2 Nevertheless, RPV5 provides a useful example of the issues that will need to be addressed and the challenges which will need to be faced. In the context of this conference, probably the most important matters to take away are that:
- (a) Regional councils do have the power within the context of the RMA to develop effective policy and rules to deal with diffuse pollution, although there is room for clarification as to the technical legal basis for those controls (which will hopefully be provided by the Court in due course).
 - (b) The science associated with identifying sources of nitrogen can be difficult, but there can be no doubt that anthropogenic sources are affecting our waterways and need to be addressed.
 - (c) Difficult socio-economic issues will arise and early and effective engagement with key stakeholders will be important.
- 6.3 Thus, despite these challenges, a means to address diffuse pollution exists – if the issue is to be addressed, there is no reason why regional councils cannot effectively do so, at the same time being aware of the competing interests that will need to be weighed and balanced in developing an appropriate set of regulatory controls and the complex and lengthy procedures through which that measure will need to pass.

Simon Berry
August 2008

APPENDIX A

NITROGEN CYCLE – AN OVERVIEW¹

W N VANT

1. To help reduce possible confusion, I have been asked to provide a simple overview of the nitrogen cycle. My intention is to help provide the overall context within which the expert statements that deal with particular aspects of the nitrogen cycle may be better understood. This section therefore deals with the nitrogen cycle as it applies to the Lake Taupo catchment as a whole.
2. There are a number of pathways by which nitrogen can enter the Lake Taupo catchment, including atmospheric deposition (e.g. via rainfall), nitrogen fixation by clover and other plants, and additions of fertilizer. These can be regarded as “inflows” of nitrogen to the system. Similarly, there are a number of pathways by which nitrogen can leave the system, or be otherwise made semi-permanently unavailable to it. These can be regarded as “outflows” of nitrogen, and include transport out of the lake down the Waikato River, burial in lake bottom sediments, export of agricultural produce outside the catchment and the return of nitrogen to the atmosphere by the process of “denitrification”.
3. A fundamental principle of ecology is that matter, including atoms of nitrogen, is neither created nor destroyed within ecosystems. Even so, nitrogen in a given chemical form, such as the nitrate ion, can be transformed to different chemical forms by various chemical and ecological processes. For example, plants like algae and grasses can transform the nitrogen present in the nitrate ion into nitrogen contained within large, complex plant proteins; this process is called “biosynthesis”. Conversely, certain bacteria can transform the nitrogen present in the nitrate ion into nitrogen gas (via denitrification), the simplest form of naturally-occurring nitrogen.
4. The nitrogen cycle of the Lake Taupo catchment thus involves the transport of nitrogen into and out of the catchment, together with the various processes of chemical transformation of individual nitrogen atoms. A convention adopted by several of the expert witnesses, including me, has been to use the term “attenuation” to refer to the removal of dissolved forms of nitrogen from groundwater, streams and the lake itself, via its transformation into nitrogen gases which are released to the atmosphere. The term also covers the conversion of nitrogen from forms that are readily-useable by aquatic organisms to other aquatic forms that are much less useable, and thus are effectively unavailable for further biosynthesis.
5. “Attenuation” thus refers to a subset of chemical transformations that together mean that a portion of the nitrogen entering the Lake Taupo catchment is not available for use in biosynthesis in the lake itself. The term thus allows us to distinguish between the nitrogen that is relevant to algal growth in Lake Taupo, and that which is not.

1 Overview based on paragraphs 2.4 - 2.16 of the rebuttal evidence of W N Vant dated 24 April 2008 presented as Appendix 3 of Opening Legal submissions presented by counsel for EW to the Environment Court on 5 May 2008.

6. Figure R1 (below) is a simple pictorial representation of the key concepts and processes of the nitrogen cycle in the Lake Taupo catchment. The upper part of the diagram does not show the specific details of the various flows and transformations of nitrogen. In particular, I have not shown the detail of the various chemical transformations (although I have outlined these in a number of cases, e.g. “denitrification”). However, the two insets, taken from the evidence of Dr Clothier and from the draft forestry leaching report,² respectively, serve to illustrate the general nature of some of the key chemical transformations. The details of these transformations are covered in the evidence of the other experts who individually deal with particular parts of the overall system.

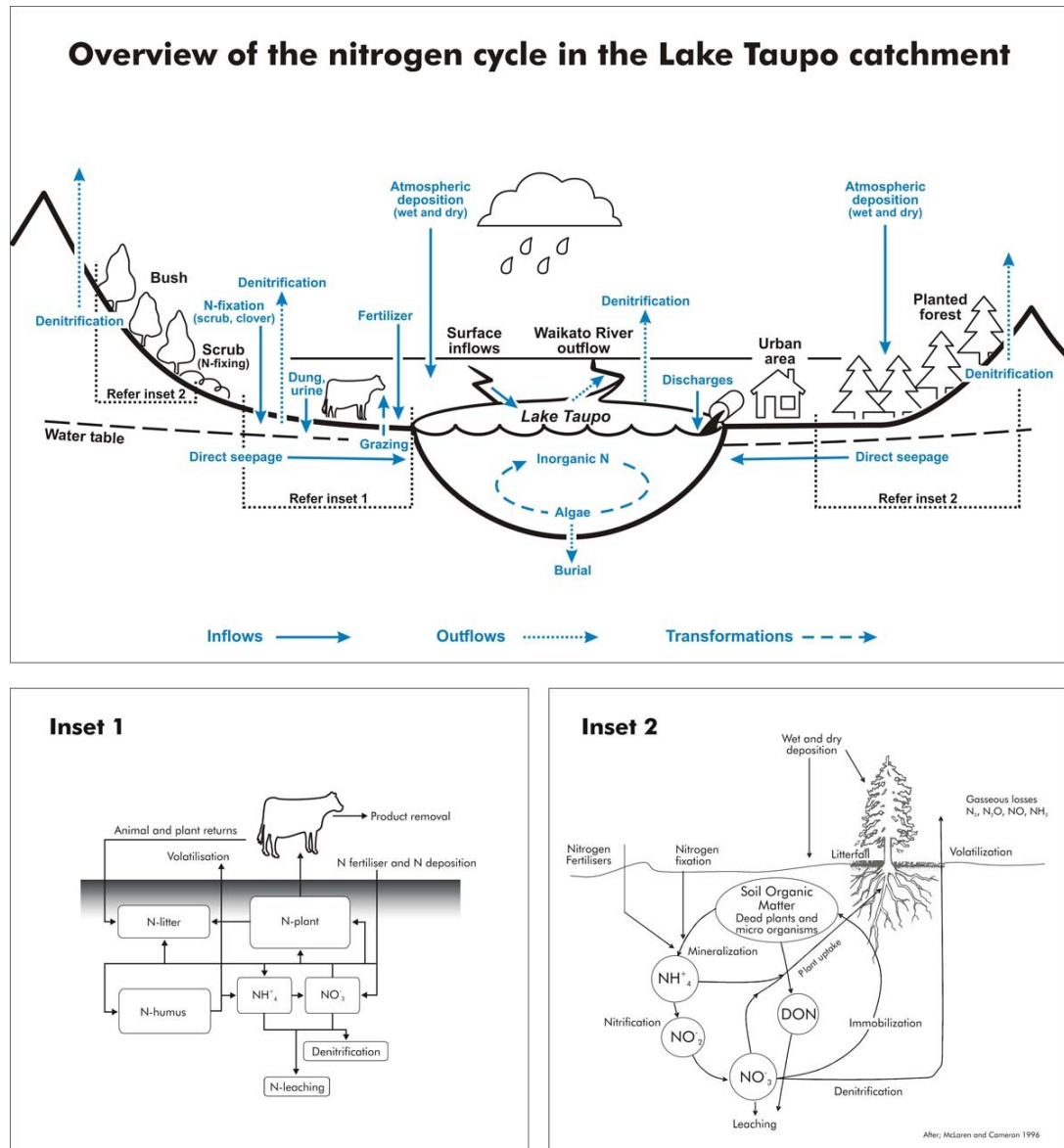


Figure R1: The nitrogen cycle in the Lake Taupo catchment. See text for details.

2. Davis, M.; Baisden, T.; Parfitt, R.; Magesan, G.; Vant, B.; Quinn, J. 2008: Nitrogen leaching from radiata pine and native forests, and undeveloped shrublands in the Lake Taupo catchment (draft). *Environment Waikato technical report (draft)*. EW, Hamilton.

7. I have used two colours in preparing the upper part of Figure R1: items in black represent key components of the biophysical setting, while those in blue refer to aspects of the nitrogen cycle. Solid blue lines represent inflows of nitrogen, dotted lines are outflows and dashed lines represent chemical transformations.
8. The inflows of nitrogen that I show in Figure R1 are atmospheric deposition, nitrogen-fixation by “leguminous” plants (e.g. clover, gorse and broom), deposition of fertilizer and animal dung and urine on pasture, and discharges from urban areas (namely stormwater and treated sewage wastewater). I also show nitrogen flowing into the lake via surface inflows (i.e. rivers and streams), and via direct seepage of groundwater. In these latter cases, the nitrogen transported into the lake by these routes has come from one or more of the various sources that I have already mentioned (i.e. atmospheric deposition, nitrogen-fixing plants, and so on).
9. The nitrogen shown in these various inflows is present in a number of different forms. For example, the nitrogen present in animal urine is dominated by urea, a simple organic chemical. By contrast, the nitrogen entering the system via nitrogen-fixation is generally present as the ammonium ion, a simple inorganic chemical (or “mineral” in the terminology used by some witnesses). The nitrogen in atmospheric deposition, urban runoff and sewage wastewater is usually a mixture of inorganic and organic forms. Much of the nitrogen in the surface inflows and in direct seepage of groundwater is present as the nitrate ion, a simple inorganic form.
10. The outflows of nitrogen that I show in Figure R1 include denitrification - loss to the atmosphere as nitrogen gas, and burial of dead and decaying algae in the bottom sediments of the lake. I also show nitrogen flowing out of the lake, and down the Waikato River. Most of this is “dissolved organic nitrogen”, a biologically-unavailable form that is produced within the lake, partly as a by-product of algal growth, but mainly as one of the results of the decay of dead algal cells.
11. Figure R1 also identifies some of the processes by which nitrogen is chemically transformed. As described in detail by Drs Clothier and Ledgard, grazing animals consume organic nitrogen in the form of grass. Much of this is converted into animal products (e.g. meat, milk and wool), and exported out of the catchment, but some of the nitrogen is deposited on the ground as dung and urine (as I have already described in paragraph 2.11). As I describe below, the nitrogen entering the soil undergoes a series of transformations, resulting in some of it being available for further plant growth. Some, however, leaches below the root zone to groundwater, and a portion of it is eventually delivered to the streams and the lake, and is thus available to be used there in algal biosynthesis.
12. Similar processes operate in forest ecosystems, as described by Dr Baisden, but in this case grazing by large herbivores is much less important. Nitrogen enters the soil in these ecosystems via atmospheric deposition and nitrogen-fixation, and from there is taken up by plants and assimilated into plant tissue. Nitrogen also enters the soil following the breakdown of leaf litter and other dead plant material. The organic forms of nitrogen in this material are partly converted to inorganic forms by the micro-organisms living in the soil, and are thus available to be used again by the plants, or to be lost by leaching below the root zone. However, some organic forms of nitrogen do not break down readily, and remain as dissolved organic nitrogen. And some of the inorganic nitrogen is denitrified, and is thus lost from the soil as nitrogen gas (together with certain other gaseous forms of nitrogen).
13. The other important chemical transformations shown in Figure R1 involve the incorporation of inorganic nitrogen into algal tissue within the lake, and the

subsequent breakdown of this organic nitrogen into a mixture of inorganic and organic forms (the latter including dissolved organic nitrogen, as I described in paragraph 2.13). The inorganic nitrogen resulting from the bacterial breakdown of dead algal cells is subsequently taken up by a new generation of algae to support their growth.