MDL
McKinlay Douglas Ltd

What Ways Can the Costs of Restoration be Shared?

A Presentation to the Rotorua Lakes Symposium 2006
Wonderful Lakes - What Value? - Who Pays?

Peter McKinlay
McKinlay Douglas Ltd

March 2006

Level 1, 17 GreySt
P O Box 13 125, Tauranga
Tel: (07) 579 4217 Fax: (07) 579 4218
www.mdl.co.nz
email: peter@mdl.co.nz

Contents

Page

1. Introduction

This presentation is based on a report which we prepared for Environment Bay of Plenty (EBOP) in 2004 with the twofold purpose of:

- Providing EBOP with a consistent framework within which to consider the optimal means of allocating current and future costs of restoring water quality as between different stakeholders including current land owners (private; public; Maori), and the district, regional and national communities.
- Identifying and making the case for a contribution from central government funds (which may well come from more than one central government agency, and be justified against different criteria – for example part may come through the process of negotiating Te Arawa's Treaty settlement; other parts may come, as the terms of reference acknowledge, from central government agencies responsible for agricultural/rural affairs, public health, the environment, and economic development).

The presentation covers four separate elements which together enable the development of a policy framework within which to consider the question of "who pays?". Those elements are:

- Polluter pays versus beneficiary pays.
- The history of agricultural development in the Rotorua district: the role of government: other contributors.
- International views on the place of environmental regulation and the options for allocating costs through regulation.
- Unbundling beneficiary pays - is it user pays for private benefits, or is it payment for public goods - and are these local, regional or national?

The presentation finishes with the conclusions which we presented to EBOP.

2. Polluter Pays Versus Beneficiary Pays

In broad terms, a policy framework for dealing with the water quality of the Rotorua lakes is concerned with two separate objectives:

- Implementing least cost means of achieving those changes required to achieve the desired reduction in nutrient levels (this issue is not further considered in this presentation).
- Allocating the costs of change in a manner that best supports the achievement of a long-term solution. This requires developing funding mechanisms (including, as a funding mechanism, foregoing economic opportunities that would produce unacceptable levels of nutrient export) that are:
  - Accepted as legitimate.
  - Have the minimum possible impact on freedom of choice in the exercise of private or collective property rights.
  - Encourage flexibility and innovation rather than prescribe a "one right way".

GENERAL PRINCIPLES

The general principles that apply in considering who should meet the cost of remediating, mitigating, or avoiding environmental damage can be seen either as a set of legal principles, imposing liability, or as a set of economic principles, designed to allocate cost in a manner most likely to incentivise the conduct required to achieve the desired result. In an ideal world, legal liability will be consistent with the economic analysis on how best to allocate costs.

Two general principles are involved.

The Polluter pays principle. Under this principle, the person whose conduct gives rise to environmental damage should meet the full costs of avoiding or making good that damage. This principle is seen as having a number of benefits including:

- It focuses attention on undertaking the proposed activity in a way that avoids or mitigates environmental damage.
- It ensures that the activity bears its full costs, thus promoting efficient resource use as the individual is unable to "cost shed" onto others by forcing them to bear part of the costs of the activity (a typical example is an activity that discharges pollutants into the environment). Unless the full costs associated with the discharge are borne by the polluter, then the polluter is able to "free ride" on the rest of the community by cost shedding the cost of dealing with pollution onto it.

The beneficiary pays principle. Under this principle, if an activity generates benefits for persons other than those undertaking the activity itself, then those persons should pay the cost of producing that benefit. Advantages of this approach include:

- The person undertaking the activity is able to receive the market value for all the benefits it generates and thus will carry it out to a socially optimal level.

- Beneficiaries themselves have the opportunity of choosing (usually collectively through an instrument of government, be it local or central) the level of that activity they wish to purchase.

Typically, the situations in which issues of polluter pays or beneficiary pays arise involve what economists refer to as externalities – benefits or dis-benefits that are incidental to an activity rather than part of its intended outcome and which impact on people other than those undertaking the activity. Typically, also, they are what can be described as "public goods" or "public bads" rather than private goods or bads which can be dealt with, between individuals, by way of contract or legal action in response to damage to private rights.

In respect of the polluter pays principle, what this typically means is that some form of government (central or local) intervention is required to ensure that the polluter bears the associated costs.

Similarly, the beneficiary pays principle typically arises in public policy only when the benefits are public goods. If the benefits are substantially private, then the private beneficiaries can contract with the person whose activity is giving rise to the benefits. A familiar example of this is the contracting arrangements that commonly exist between orchardists and beekeepers for pollination services.

A particular difficulty for policy makers is the asymmetry between the way in which these two principles are applied. The incentives facing policy makers (governments both central and regional) tend to favour intervention when polluter pays is the issue. Fiscally, there is usually a net gain to the regulator. It is able to cover the costs of regulation, perhaps through fees, perhaps through other means, and regulation can typically be seen as avoiding costs that the government or council might otherwise have to bear.

Intervention on the basis of the beneficiary pays principle is rather more difficult. By definition, this involves a government or a council making a decision to pay for a benefit that many people will see as relatively diffuse. It may be difficult to move from the general proposition that a particular course of action will give rise to benefits, to the next stage of determining just who will receive those benefits, what value they might attach to them and how and by whom payment for those benefits should be made.

THE GENERAL PRINCIPLES IN APPLICATION

The commonest application of these two sets of principles has been in regulating and/or allocating the costs of future activity.

It has long been accepted that it is entirely appropriate for governments to regulate, without compensation, to restrict private property rights in order to protect public interests. The argument is well put in a recent Australian Treasury article *Public Good Conservation and The Impact of Environmental Measures Imposed on LandHolders.* The paper notes:

> "Private land holders may object in the belief that their private property rights are being infringed through the application of this principle.

> "However, there are many other analogous measures that restrict private behaviour in order to protect public goods. For example, pollution control for factories, urban planning laws, and speed limits on roads all restrict private action in order to protect the public interest.[1]"

The polluter pays and beneficiary pays principles have been easiest to apply when dealing with specific activity linked to known and identifiable impacts. It is this, for example, that underpins much of environmental regulation in New Zealand with an emphasis on regulating or prohibiting activity in order to control environmental impacts.

Non-Point Source (Diffuse) Pollution

It is more difficult to apply the principles when one or both of two other conditions apply:

- The focus of concern is non point source pollution, that is, the pollution cannot be linked back directly to a specific property/activity but, instead, comes from a variety of sources, activities and/or properties.
- The focus of concern is pollution resulting from activities that have already been undertaken, perhaps years ago, and which may have been legal, even encouraged by government, at the time.

The principal issue with non point source pollution is one of demonstrating causality in terms both of:

- The link between a specific activity and the environmental outcome; and
- Where more than one activity may be a contributor, the proportionate contribution each activity has made or is expected to make.

These concerns emphasise the importance of understanding the processes giving rise to the environmental impact. They put an emphasis on investment in research and on communicating research findings as the basis for any regulatory or other interventions to mitigate or avoid the expected impact.

This is important not just for the legitimacy of any measures that may be implemented. It also, critically, goes to the question of effectiveness. If causal relationships are not well understood, then regulatory interventions may be ineffective.

Generally, it is now accepted that environmental regulation to control future activity contributing to non point source pollution is a legitimate exercise of regulatory power. It does, though, raise one important question which will be discussed below; how the costs of that regulation should be borne if it results in a significant impact on the value of existing property rights.

[1] Commonwealth Treasury of Australia (2001) p100

Retroactivity

Responsibility for remediating or mitigating the environmental impact of past activities raises more difficult questions, especially, if as is usually the case, those activities were lawful at the time they were undertaken.

This issue needs to be considered in two separate contexts;

- Environmental damage which is the consequence of defined activities that took place on the site which is now degraded.
- Environmental degradation that has resulted from activity which took place elsewhere, especially degradation that has resulted from non point source pollution.

The World Bank Group, on its website, provides a useful overview of domestic and environmental law; concepts and issues at http://www4.worldbank.org/legal/legen/legen_domestic.html.

> "Retroactive liability is the hallmark of modern soil statutes and constitutes an exception to general principles of law. Under these principles no one should be held liable for the acts of another or for actions that were lawful when they were taken. Many governments have invoked this exception as a solution to the contamination of land by hazardous wastes. In urban areas land contamination often results from decades of intensive industrialisation that has occurred without any meaningful pre-existing environmental standards. Under some soil statutes current and past owners of contaminated land may be held liable for clean-up costs, even if they have not personally contributed to the contamination. Under certain circumstances operators, transporters, and, to a limited extent, lenders can also be held liable. Retroactive liability is still controversial and has raised some problems. It has important economic consequences, as the value of such land may drop precipitously in cases where clean-up costs exceed the property's value. In the long run, retroactive liability can also result in new investments going only to pristine "greenfield" sites, to avoid contaminated areas that are often situated in disadvantaged communities. Despite these difficulties the harshness of the liability provision has, in some countries, coerced industries into better environmental behaviour and substantially minimised major health risks.[2]"

In New Zealand, it is now accepted that property owners are liable for any contaminants on sites that they own, regardless of whether they were responsible for that contamination or even whether they had any knowledge of it.

Remediating contaminated sites can be extremely expensive. As an admittedly extreme example the budget for cleaning up New Zealand's most notorious contaminated site, the former Fruitgrowers pesticide factory site at Mapua, near Nelson, is estimated at $6.5 million[3].

[2] The World Bank Group

[3] Tasman District Council

Retroactive liability, for site specific contamination, can be seen as consistent with the economic principles that liability should lie with the party or parties who have the greatest incentive to find a solution. In the case of contaminated sites, liability rules place a strong incentive on potential purchasers, lenders and site owners to identify and deal with any existing problems. It also provides a mechanism for meeting the costs; an adjustment in the market value of a contaminated site to reflect the expected costs of the cleanup.

It does, however, encounter one difficulty; the greater the potential cost of remediation, the more difficult it may be for those immediately involved to afford the cost. In the Mapua case already referred to, the bulk of the cost is being met by government and the district council. The firm that originally owned the site no longer exists. The property and some cash were acquired by the district council from the company as part of a remediation strategy that recognised the inability of the owner to meet the full costs.

In recognition of the difficulties that some owners may face in remediating contaminated sites that are a high priority for reasons such as risk to human health, the government in 2004 established a fund for the cleanup of what are described as Orphan Contaminated Sites. These are defined as those sites where either no party can be fixed with legal liability, or where the liable party is unable to fully fund the remediation.

Criteria to assist with determining which sites will be cleaned up through assistance from the fund will be approved by Cabinet. Sites identified for cleanup will be on a case by case basis. All money to be used for scoping and site cleanup will be negotiated and specified in contracts approved by the Minister for the Environment.

From a policy perspective, what this strongly suggests is government seeking to manage the tension between its preferred (and the legal) position that remediation is the responsibility of current (and former) owners, the inability of some owners to meet the full costs, and the potential risks to public health if seriously contaminated sites are not dealt with.

Retroactive liability for non point source pollution has proved much more difficult to address. Part of the problem of doing so is causality – how to determine in what proportions different parties (properties/activities) should be held responsible for what consequences.

Another complication is cost. The costs of remediating lake water quality, in the sense of dealing with nutrients already in the lakes, or in ground water feeding the lakes, pro-rated to reflect the presumed contribution from pastoral agriculture, would represent a very significant proportion of the private wealth currently invested in pastoral agriculture within the catchments. Similarly, the cost of land use change required to reduce future nutrient exports to an acceptable level would also represent, in net present value terms, a significant proportion of that same private investment. The international literature clearly suggests that, although it is normal practice for the costs of environmental regulation, especially in terms of future conduct, to fall on the parties affected, it is also clear that this is a matter of degree. If the impact is relatively marginal, then imposing costs on the parties concerned is seen as perfectly legitimate. The same is the case if the principal effect is to discourage investors from entering a new activity – they can simply find an alternative investment. However, where the cost of regulation is

significant in relation to the private wealth of the actors involved, there is a strong sense that considerations of equity and fairness argue against requiring those individuals to bear the cost.

A further difficulty, particularly in dealing with pollution that has resulted from agricultural activity, is that the activities concerned were not only legal but actively encouraged. In New Zealand, for example, maximising agricultural output was a primary focus of successive governments until the mid 1980s.

Land development schemes were a major feature of the mid 20th century, with government acting both as a major developer and as funder of other development which it did not, itself, carry out.

In 1963, the Agricultural Development Conference set a target for a major expansion of pastoral exports over the following decade. The government response included measures such as subsidies on the carriage and price of phosphatic fertiliser, favourable tax treatment for livestock, and subsidised lending through the State Advances Corporation.

In the mid 1970s, when production levels were falling short of the desired rate of growth, the government again responded with measures such as the Livestock Incentive Scheme and Land Development Encouragement Loan Scheme[4].

Internationally, for reasons such as those just outlined, there has been a considerable reluctance to impose retrospective liability for non point source pollution.

AUSTRALIA

The issue has been widely debated in Australia with the conclusion, generally, being that it is inappropriate to hold farmers responsible for making good the damage from past activity. Examples include:

Economics of Cost Sharing for Agri-Environmental Conservation a paper delivered at the 1998 conference of the Australian Agricultural and Resource Economics Society, provided a detailed analysis of the economic efficiency arguments associated with achieving desired environmental outcomes. It noted the strong efficiency arguments associated with the polluter pays principle in terms of future activity. The author cites with approval both OECD and European Union statements that the polluter pays principle should apply to agriculture as it does to other economic activity – but those statements were concerned with future activity, that is, activity undertaken in the knowledge of the regulatory implications and costs. He quotes with apparent approval another authority noting "the key issue here is the perception of unfairness that arises from imposing liability for activities that, at the time they were carried out, were in conformity with the applicable law, and indeed may have been in accordance with the contemporary good, or at least acceptable, industry practice.[5]" He also notes that in the USA, under the

[4] Birks, Stuart; Chatterjee, Srikanta (1992)

[5] Marshall, Graham R (1998) p7

Comprehensive Environmental Response, Compensation and Liability Act liability for pollution was made retroactive but notes that there is no economic efficiency justification for such an interpretation of the polluter pays principle. "Since it is simply not possible after the fact to change behaviour in an earlier period, past inefficiencies should be regarded as sunk costs.[6]"

More significantly, he points to the risk associated with introducing a principle of retroactive liability. It "may create future inefficiencies by increasing the risks that firms and other parties face regarding their environmental responsibilities. In compensation, they will require a higher rate of return on invested capital, resulting in higher consumer prices. The risk premium they will demand is also likely to be higher than the public would be willing to pay to avoid the risk, since the public is in a much better position to spread such risks"[7].

Water Reform: Who Pays for the Environment: This paper prepared for the National Competition Council discusses a possible framework for considering how to allocate the cost of mitigating the environmental damage resulting from water use. On the question of past environmental damage, it quotes from a staff research paper on biodiversity conservation prepared for the Productivity Commission which concluded:

> "From an economic perspective, there is little rationale to charge retrospectively for biodiversity loss because it is not possible to change past behaviour and correct past inefficiencies. As a result, the efficiency gains from applying the "impacter pays" principle [the polluter pays principle] may not apply for the case of degradation caused by past activities. Further it may be considered inequitable to penalise impacters retrospectively for complying with the accepted legal frameworks and the policies of the past.[8]"

In November 2002 a group of leading scientists, known as the Wentworth Group, produced ***Blueprint for a Living Continent***. That paper argued for a major investment of public capital in order to restore the degraded parts of the Australian landscape. Their stated rationale included "the reality is quite simple – we cannot fix our environmental problems by wishing them away and we can't expect our farmers to pay the full cost of repairing past mistakes. Our nation was built on the back of our rural industries and all Australians have benefited, not just farmers.[9]"

In a paper, ***Land Degradation and Rehabilitation: A Policy Framework***, presented to the fourth annual symposium of the Australian Agricultural and Resource Economics Society, the authors, respectively a visiting researcher and a commissioner with the Productivity Commission, posed a number of questions. In respect of retroactive liability, they commented "realistically, there are limits to the income that landholders can be expected to forego for the benefit of others, and this limit is perhaps lower when it is clear that government policies have

---

[6] ibid

[7] Marshall, Graham R (1998) p7

[8] Cope, Deborah (2002) p31

[9] The Wentworth Group of Concerned Scientists (2002) p16

> contributed to the problems being addressed. The public's recognition of the merits of addressing – preventing and reducing – land and water conservation, and that they will be ultimate beneficiaries, strengthens the political economy case for a significant contribution from taxpayers.[10]"

In November 2000 the Council of Australian Governments (COAG) launched the National Action Plan for Salinity and Water Quality.

This plan is intended to counter the growing problem of salinity which affects most of Australia. Agriculture has been a principal contributor.

The plan includes acceptance by COAG that meeting the cost of remediation is the responsibility of taxpayers (both federal and state) and that this may include providing compensation for the impacts of land use change, as much as anything in order to ensure community support.

In this respect, the section in the foreword for the plan dealing with improved governance for land and water management states:

> "Reform of pricing, property rights and regulatory instruments for land and water use is needed to protect the long term profitability and sustainability of the resource base.
>
> "Governments will need to evaluate the social impacts of such reforms on regional communities and recognise that compensation and adjustment assistance may be required. Without adjustment assistance, reform may be divisive, not supported by affected communities and possibly unachievable.[11]"

EUROPE

In Europe non point source pollution is referred to as diffuse pollution. The following definition, sourced from the Scottish Environment Protection Agency, is representative of what the term covers in European environmental policy:

> "Diffuse Pollution comprises true non point source contamination and pollution arising from a multiplicity of dispersed, often individually minor, point sources. Examples of true non point sources are sheet run off from fields or seepage of nutrients from soil into ground water. Examples of minor point sources are field drains or surface water drains in urban areas. Diffuse sources are often individually minor, but collectively significant.[12]"

The Commission of the European Communities has been developing a ***Proposal for a Directive of the European Parliament and of the council on environmental liability with regard to the prevention and remedying of environmental damage***.

---

[10] Edwards, Geoff; Byron, N (2001) p32

[11] Council of Australian Governments (2000) p9

[12] Scottish Environment Protection Agency (2004)

The stated purpose of the proposal is to "establish a framework whereby environmental damage would be prevented or remedied.[13]" The proposal makes it clear that:

> "This directive shall not apply to environmental damage or to an imminent threat of such damage caused by pollution of a widespread, diffuse character, where it is impossible to establish a causal link between the damage and the activities of certain individual operators.[14]"

The Commission has put out a set of frequently asked questions providing background on the proposal. The FAQs dealing with farming are:

> **"Is farming covered by the proposal?**
> It is, in several ways. The proposal imposes fault liability on all occupational activities, i.e. including farming, for damage to bio-diversity.
>
> Farming is also covered by strict liability to the extent that it involves handling dangerous substances or wastes. The same defences as for all other activities covered by this proposal would apply to farming."
>
> **"Will all the farmers in the future be required to pay for all the nitrates pollution they cause?**
> Nitrates pollution is mainly diffuse and therefore mostly outside the scope of this proposal. It is inefficient to address the external costs caused by diffuse pollution with liability. Other, better suited, policy instruments are being used to tackle the problems caused by nitrates pollution.[15]"

New Zealanders, familiar with what appears to be the preferential treatment given to farmers within the European Union, might see the exemption for diffuse pollution as another example of agricultural protectionism. However, the proposal itself advances arguments that are more consistent with concerns about the ability to enforce legal liability, and related issues of economic incentive – the view that the way in which liability is imposed should incorporate incentives to encourage the type of conduct desired.

The proposal states:

> "Not all forms of environmental damage can be remedied by means of the liability mechanism. For the latter to be effective, there need to be one (or more) identifiable actors (polluters), the damage needs to be concrete and quantifiable, and a causal link needs to be established between the damage and the identified polluter(s). Liability is therefore not a suitable instrument for dealing with pollution of a widespread, diffuse character, where it is impossible to link the negative environmental effects with the activities of certain individual actors.[16]"

---

[13] Commission of the European Communities (2002) p2

[14] Ibid p40

[15] European Commission (2002)

[16] Commission of the European Communities (2002) p33,34

The European approach is to look at alternative means of dealing with the costs of remediation. A ***European Commission White Paper on Environmental Liability***, published in February 2000, notes:

> "In order to be able to deal with historical and other forms of pollution for which liability would not be a suitable instrument, for instance in the case of diffuse damage or in cases where the polluter cannot be identified, Member States could use – as some already do – other instruments, such as impact fees levied on polluting activities or funds established at national or regional level.[17]"

Here, the policy approach is one of treating the industry as a whole as the liable party. Water quality issues are addressed by a combination of levies and regulatory interventions. Superficially, the same approach, especially the use of levies on production, would seem worth considering in New Zealand.

However, it is critical to consider not just the nature of the instrument, but who ultimately bears the cost. Within the European Union, levies on farming tend to be passed onto consumers either directly through prices, or indirectly through farming subsidies.

There is no equivalent mechanism available for New Zealand producers. The vast bulk of our agricultural produce is exported. We lack any mechanism for passing on to overseas consumers the cost of regulatory or other environmental protection measures imposed on New Zealand farmers. Accordingly, following that approach in New Zealand would be the equivalent of a dedicated tax on farming.

The European practice, nonetheless, provides a useful analogy for the New Zealand situation. The rationale for using mechanisms that ultimately impose a cost on consumers reflects a belief that it is European consumers who are the beneficiaries of agricultural production. In other words, the underlying principle justifying the funding mechanisms is the beneficiary pays principle.

In New Zealand, it is taxpayers who are effectively the beneficiary group, as representing those who benefit from the economic growth that agricultural production has enabled. Accordingly, the New Zealand equivalent of European consumers meeting the costs of remediation is taxpayers doing so as the equivalent beneficiary group.

ENGLAND

In England the Department for Environment, Food and Rural Affairs and the associated Environment Agency have been developing policy and exploring means for responding to the directive on environmental liability. The Environment Agency, in conjunction with English Nature has recently concluded a research project ***Field Development of Grant Aid Proposals for the Control of Diffuse Agricultural Pollution***.

The Agency reports that farmers were generally very supportive of a two-tiered grant aid arrangement:

[17] European Commission (2000) p30

Basic Plan: A grant aid package to finance a soil/nutrient management plan requiring the farmer to adopt basic good practice (tier one) and comply with existing regulations as a minimum standard. Farmers would be eligible for additional countrywide grant aid to adopt tier two measures.

Plan Plus: A funding package to finance the proactive, advanced planning and farmer networking required to achieve rapid change in priority catchments. This activity would be supported by a catchment appraisal of pollution risk and required management changes, with liaison with the farming community overseen by a project officer. More detailed farm planning would outline the combination of high cost tier three measures that need to be adopted within high-risk areas of the catchment. Adoption of the basic plan would be a pre-requirement for entry into plan plus[18].

The researchers made recommendations for scaling up the project to cover all of England and Wales and conclude that "their recommendations are compatible with the structure of the emerging agri-environment package being developed by DEFRA, but greater funding and more and better farm advice has to be available to implement the proposals. A number of proposals have been made to address this shortfall, including the use of CAP reform mechanisms and nutrient taxes/levies.[19]"

SUMMARY

The polluter pays and beneficiary pays principles provide useful general guidance when considering the allocation of the costs of mitigating, avoiding or remediating environmental damage. In brief, the principles lead to the conclusion that liability should be allocated so as to maximise economic efficiency, that is, return on investment, recognising that the return can include what would normally be thought of as environmental goods, as well as economic goods. Indeed, this is implicit in both principles. The costs of pollution, and the benefits of avoiding it are often environmental goods which may not necessarily have a direct economic value.

What the principles do not do is provide easy answers to questions such as who benefits? These are often judgmental. As an example, restoring water quality in the Rotorua lakes could be seen as producing at least the following types of benefit and beneficiaries:

- Economic benefits to commercial interests using the lake (tourism; fishing; commercial recreation).
- Aesthetic benefits to residents and visitors – the pleasure which comes from contemplating a beautiful lake.
- Usage (consumption) benefits to individuals who undertake recreational or other activities associated with the lakes.
- Cultural and spiritual benefits, especially for Maori for whom the lakes are a taonga.

[18] Blackburn, Oliver (2003)

[19] Blackburn, Oliver (2003)

- Reputational benefits for New Zealand's economy and society as a whole – as improving lake water quality underpins our international reputation (positioning) as a clean, green society.
- What economists' term "option benefits" which people enjoy from contemplating the possibility of enjoying lakes restored to a high standard.

Assessing benefits, by allocating some notional value or weighting to them as a means of underpinning an allocation of costs in accordance with the beneficiary pays principle, is at least as much an art as it is a science (although there are now available quite sophisticated models for determining the value that people will place on different options, applying these is extremely expensive and not yet totally reliable).

The most difficult area in which to apply these principles is that of retroactive liability. From an economist's perspective, the polluter pays principle has no application to dealing with the consequences of past actions. Those cannot be changed, so imposing costs with the intention of incentivising a different outcome is futile.

Instead, the literature and policy debate, internationally, suggests that decisions on allocating the costs of past damage are a combination of:

- Political expediency.
- Fairness and equity – for example, should someone be penalised because he or she (or some past user of the property he or she now occupies), acted in accordance with then good practice, possibly encouraged by government.
- The beneficiary pays principle.

On reflection, it is the beneficiary pays principle that is likeliest to provide guidance in situations such as that faced by the Rotorua lakes. The very fact that there is a concern to deal with the lakes water quality problem is an implicit argument that a value is placed on doing so which is at least the equivalent of the cost. Were it otherwise, the social judgement to intervene would be a waste of resources. If we do not place a value on the expected benefits from remediating lake water quality that is equal to or greater than the cost of doing so, then we ought not to undertake remediation. The resources involved would be better used elsewhere, invested in activities that generate a benefit at least the equivalent of their cost.

This view reflects the common view in the research on remediation which often defaults to the taxpayer (or ratepayer) as the logical party to pay for the costs of remediation on the grounds that:

- The principal purpose of remediation is to generate a stream of benefits (economic; environmental; spiritual and cultural).
- The majority of those benefits are typically public goods and accordingly, as with other public goods, best paid for from the public purse.

3. The History of Agricultural Development in the Rotorua District: The Role of Government and Others

The Rotorua and District Historical Society Inc 1980 publication ***"Rotorua 1880-1980"*** includes a section on farming settlement and development. It records early government initiatives in the late 1920s that were slowed significantly by the depression and then the commencement of the Second World War. The author then goes on to record:

> "In 1944, however, Lands and Survey appointed RL Innis to be Superintendent of Land Development, Auckland, and his district included Rotorua. So the organisation was ready in 1948 when government, due to the pressure to settle ex-servicemen on the land and the need for increased production, decided to commence more large-scale development of unimproved land.
>
> "This was the start of a period in which a dramatic transformation took place in the Rotorua district and surrounding region. Large areas of unimproved land were rapidly brought into pasture and production. Stock numbers multiplied almost over night, many miles of new roads were constructed, electric power reticulation extended, buildings erected, water supplies installed and in a few years new settlers moved in with their families to take over their own farms.[20]"

As an indication of scale, the author notes:

> "From 1944 to 1980 the Rotorua branch of Lands and Survey Department will have settled 10,578 hectares in 1,022 farms (691 dairy, 321 sheep) and will still be farming 69,839 hectares of grass in 50 blocks. These blocks in turn will be subdivided for settlement, as government policy is to make a number of farms available for ballot each year.[21]"

The same publication also provides a brief overview of Maori land development. It notes the initial success of Sir Apirana Ngata in securing 8,343 acres at Horohoro for development by the Board of Maori Affairs, followed by other development schemes which, around Rotorua, included Taheke, Okere, Tikitere, Wharenui, Peka, Parekarangi and Tihiotonga.

Government was a major influence on the development of pastoral agriculture in Rotorua not just as a land developer, but also through its general policies to encourage farm development.

Encouragement of Agricultural Production

A useful overview of government policy through the 1960s and 70s is provided in the following extract from ***The New Zealand Economy: Issues and Policies***, published in 1992:

[20] Mulligan, GE (1980)

[21] Ibid

"The Government organised a major conference of all the interested parties in 1963 – the Agricultural Development Conference – and after scrutiny of the available technology and capital base, it was agreed that a major expansion of pastoral exports was possible over the next ten years. The total number of livestock required was estimated in terms of stock units and targets were set for livestock expansion through to 1971-72. The conference reviewed the constraints that might impede the achievement of these targets and recommended to Government that a number of suitable incentive schemes for farmers would be required. The understanding was that increased investment would be required in pasture development and associated facilities like fencing, water supplies, roads and buildings. It was assumed that farmers would raise investment levels if the necessary initiatives were provided.

"The Government adopted most of the recommendations of the Agricultural Development Conference and introduced a range of incentives for pastoral farming. The State Advances Corporation was instructed to establish a development loan programme for pastoral farmers. Government subsidies were provided on the carriage and price of phosphatic fertiliser, and the Department of Inland Revenue established the nil standard value of livestock valuation system. The latter effectively operated to lower the value of output on which tax was assessed, and hence encouraged existing farmers to plough back more investment in their properties.

"Livestock outputs did expand along the expected path in the late 1960s though the livestock targets set out for 1971-2 were never quite reached. Farmers reacted in a fairly rational way to the incentives that were provided for output expansion and many new areas were developed for pastoral production.

"In 1978, the Government moved to institute more permanent arrangements to supplement farm incomes and introduced a government-financed floor price scheme for all the major pastoral products – beef, sheep meat, wool and dairy products. This was the Supplementary Minimum Price scheme – SMPs….. The prices were to set so as to provide farmers with a reasonable standard of living and thus encourage them to maintain and improve the output of their farms with the ultimate goal of increasing export revenue.

"By the mid-1970s Government was again dissatisfied with the rate of growth of output and exports and further programmes for development finance were introduced for expanding farm production. The Livestock Incentive Scheme was introduced in 1976 and the Land Development Encouragement Loan Scheme was introduced in 1978…. Essentially the loan schemes offered a rebate of interest and some principal if certain targets for development were met. Many of these loans were taken up by pastoral farmers and considerable expansion of pastoral area and output resulted.

"The 1960s and 1970s were thus a period of increasing intervention by Government in the agricultural sector.

"The intervention took place in an attempt to guide farmer decision-making toward investment and production. The objective was clearly stated to be one of increasing export returns from pastoral production. As New Zealand entered the

> 1980s, the cost of maintaining this programme of support for agriculture became extremely high, and eventually it was discontinued.[22]"

The Ministry of Agriculture and Forestry, as the government's principal advisor on agricultural policy, acknowledges that the role of government encouraged significant misallocation of resources including farming beyond biological and physical limitations. In a 1996 publication ***The Environmental Effects of Removing Agricultural Subsidies: The New Zealand Experience***, the Ministry states:

> "The past mix of agricultural support and resource development policies encouraged farming systems and land use patterns that in some areas were not sustainable. For example, the livestock price supports, when combined with fertiliser and land development subsidies, diverted significant amounts of financial and scientific resources into pastoral farming systems. This package of subsidies encouraged clearance of native forest, followed by sowing and heavy fertilisation of pasture. The artificial profitability of livestock farming, especially sheep, encouraged farmers to run stock numbers that exceeded the long-term productive capacity of the land resource. Government's willingness to assist farmers after adverse climatic events further reduced risk exposure and the cost of farms exceeding biological and physical limitations.
>
> "In the past decade, New Zealand has implemented wide-ranging general economic and environmental reforms. Government intervention in the economy, including in agriculture, had led to severe misallocation of resources and high levels of assistance which could no longer be maintained. With general economic reforms in 1984 and succeeding years, government assistance to agriculture was virtually eliminated.[23]"

It would be going too far to say that the government should carry the full responsibility for the impact of pastoral agriculture on lake water quality because of its combined roles in land development and in the encouragement of pastoral agriculture generally. However, it seems clear that it must carry a significant measure of responsibility for decades of a government led strategy for economic growth based on increasing pastoral production as the principal means of increasing New Zealand's export income and financing the imports that the economy required. The present government's preferred policy stance is that it is under no obligation to accept responsibility for policy mistakes of previous governments. That is an understandable attitude for a government concerned to minimise fiscal risk. However, it appears to overlook factors such as:

- New Zealand's present level of prosperity (such as it is) is substantially the result of the returns that pastoral agriculture has generated and continues to generate. It is inappropriate that government, as the representative of taxpayers (and the community generally) should in effect say that it is happy to accept the benefits that have accrued from agricultural development but wants no part of the responsibility for the associated negative impacts.
- The crucial issue for remediation is "if not the taxpayer, then who?" The practical reality is that few if any other groups have the ability to meet the costs of remediation, especially if the government as a major partner in contributing to the problem were to deny any responsibility.

[22] Birks, Stuart et al (1992)

[23] Ministry of Agriculture and Fisheries (1996)

OTHER CONTRIBUTORS

The material we have considered, outlining the history of water quality problems in the Rotorua lakes, identifies a number of different contributing factors. This is in marked contrast to the Lake Taupo situation where the current consensus is that nutrient export from pastoral agriculture is by far the most significant contributor to deteriorating lake water quality.

In the two principal Rotorua lakes (Rotorua and Rotoiti) and to a lesser extent in the other Rotorua lakes, there have been and are three different principal categories of sources of nutrients that have been responsible for reductions in lake water quality. These are:

- Discharge of treated sewage (for many years, until the early 1980s, Rotorua's sewage was pumped into the lake with treatment to meet public health rather than environmental benchmarks) and seepage from septic tanks (a number of lakeside settlements are still dependent on septic tanks).
- Nutrient export from pastoral agriculture, primarily carried from farm properties to the lake via ground water.
- Natural "point" sources such as Tikitere and the Hamurana Springs.

The waters of lakes Rotoiti and Rotorua are affected not just by ongoing "imports" from the three principal sources outlined. Both lakes also have a very significant internal source of nutrients; sediment at the bottom of the lakes which has built up over many years. For Lake Rotoiti, the internal source is not just nutrient release from its own lake bottom sediments, but nutrients in sediments carried through from Lake Rotorua via the Ohau channel.

This combination of external and internal sources means that restoring lake water quality in lakes Rotorua and Rotoiti is a more complex matter than restoring lake water quality in Lake Taupo.

As well as addressing land management[24] issues (the sole solution being pursued for Lake Taupo), it is necessary also to:

- Minimise or, ideally, eliminate the discharge of any nutrients sourced from sewage.
- Minimise the contribution from natural "point" sources such as Tikitere and Hamurana.
- Address the problem of sediment flow from Lake Rotorua into Lake Rotoiti.

It is also necessary for lakes Rotorua and Rotoiti to deal with the impact from lake bottom sediments. For large parts of the year, the lake bottom waters are anoxic, a condition that triggers the release of significant amounts of nutrient (nitrogen and phosphorous) in proportions that favour the growth of blue-green algae.

[24] Which includes both changes in land use and in how the land is managed.

The fact that there are a number of different sources of nutrients gives rise to a further complexity, that of assigning causality. With Lake Taupo, there is room for debate over how long it will take nutrients to move, via groundwater, from the on-farm source to the lake but there is very little room for debate about what the source actually is. Very clearly, the principal contributor is pastoral agriculture so that any solution needs to address that source.

For the Rotorua lakes, the situation is different. Not only are there multiple causes but MDL also found in interviews with stakeholders that there were differing views about causality. There were clearly some who took the view that the real culprit was Rotorua City because of years of discharge of sewage. Another view expressed (and probably reflecting a misunderstanding of the science involved) was that if nutrient rich groundwater flowing into the lakes was approximately 80 years old, then the source had to be something other than pastoral agriculture because there was no pastoral agriculture 80 years ago. People expressing this view clearly believed that a combination of natural sources and Rotorua's sewage disposal were the principal contributors.

These are matters that will need to be addressed in developing and implementing an appropriate policy framework. Good public policy is not just technically robust, and evidence based; it is also legitimate in the sense that those adversely affected by it nonetheless accept that it has been fairly and appropriately put in place. Often this will include understanding at least the basics of the arguments for the policy. This is important not just for preserving the legitimacy of the organisation in developing and implementing the policy; it is also important for enforcement. People who accept that a policy intervention is legitimate in the sense just outlined will be much more likely to comply than people who believe that it is illegitimate.

This will clearly be a factor in implementing the short and long term measures that EBOP and the Rotorua District Council have been developing, including rule 11[25] and the different engineering initiatives currently under consideration (such as the proposed groynes, reoxygenation of the bed of Lake Rotoiti, the possible diversion of the Ohau

[25] Rule 11 is a rule that was being promulgated by EBOP for inclusion in the Regional Water and Land Plan whilst we were preparing our report. It is now in place. The rule is intended to regulate the discharge of nitrogen or phosphorus to water, or on to land, where:

That nitrogen or phosphorus may enter surface water or ground water.

The discharge is from certain defined activities.

It would result in a net increase in the export of nitrogen or phosphorus from a property.

Where those conditions apply, the discharge will be a discretionary (restricted) activity from the date the plan becomes operative. Essentially the activities are, within the catchments of lakes Rotoiti, Rotoehu, Okaro, Rotorua and Okareka conversion to or intensification of agricultural activities including dairying and change in land use to unsewered residential resulting in a net increase in the export of nitrogen or phosphorus from the property. The rule is intended to be prospective, not retroactive, so that existing levels of discharge will remain lawful. The rule is also designed to be flexible by targeting the level of discharge rather than the activity itself. Thus, for example, if a farmer is able to intensify agricultural production without increasing the level of discharge of nitrogen or phosphorous, then that intensification will be permitted.

channel so that it flows directly into the Kaituna, and enhancement of the city's waste water treatment plant.

A final, and very significant, component of the background for this project is the interest of Tangata Whenua. At the time our report was being prepared negotiations were taking place between the Te Arawa Trust Board and the Office of Treaty Settlements on the terms and conditions under which ownership of the beds of the Rotorua lakes will be revested in the Trust Board. Tangata Whenua regard the lakes as a taonga and clearly have quite strong views about the obligations of the Crown.

The Te Arawa Trust Board, EBOP and the Rotorua District Council work together as the lakes strategy committee. One of the factors that the government set out as justifying a contribution to the remediation of Lake Taupo was the treaty relationship with Tuwharetoa.

Against that background, a question for EBOP, the Rotorua District Council and the Te Arawa Trust Board to consider is whether the Crown's treaty obligations should simply be seen as one matter to weigh in the balance when considering the case for a government contribution, or whether it should be seen as an entirely separate matter.

This report takes the view that the issue of the Crown's obligations to Te Arawa arising from the treaty is an issue that belongs to Te Arawa rather than to EBOP or the Rotorua District Council. It will be very appropriate for EBOP and the Rotorua District Council to provide what support they are able for the Te Arawa Trust Board in its negotiations with the Crown (including co-operation both on lakes research and on making the case for government funding for lakes research) but the treaty right belongs to the Trust Board not to EBOP or the Rotorua District Council.

4. Unbundling Beneficiary Pays

In this section of the report we discuss the process of applying the general principles covered earlier in respect of beneficiary pays to the specific situation of the Rotorua lakes.

INTRODUCTORY COMMENTS

In doing so, we note the complexity of the Rotorua situation, in particular that certain of the works that are desirable as short term remediation measures would almost certainly proceed regardless of lake water quality issues. These include the sewerage developments around Lake Rotoiti and the further work on upgrading the city's effluent plant. The next factor is the different character and certainty of outcome of the various initiatives under consideration which we categorise as short term, research and long term.

Another factor, which is very important in a contextual sense, is emerging government policy on taxpayer contribution to environmental remediation. The "first cab off the rank" in seeking approval from government for support for the remediation of lake water quality was Lake Taupo. In response to an approach from Environment Waikato and the Taupo District Council, the government made a decision on the extent to which it would support remediation and, in doing so, laid out a set of principles against which to measure the nature and extent of government's contribution. From a beneficiary pays perspective, these factors are extremely important in the sense that, to the extent the beneficiaries of remediation are the public at large, the taxpayer is the logical player -- a normal situation where benefits are national public goods.

I turned first to considering the short-term goal research and long-term issues and then address the Lake Taupo precedent.

SHORT TERM

Amongst the short term measures under consideration at the time our report was prepared were additional sewerage schemes around Lake Rotoiti, improved effluent treatment in the city plant, the construction of groynes at the entrance to the Ohau channel, its possible diversion so that it flows directly into the upper Kaituna river and re-oxygenation of the bed of Lake Rotoiti.

We were advised that the proposed upgrades of the treatment plant were conventional projects and we assumed that the sewerage schemes will be engineered to meet resource consent conditions on discharge of nutrients. Accordingly, these measures are already at a stage at which it can be asserted that:

- Expected costs are within known parameters.
- There is a high measure of confidence about the environmental outcomes.

From the advice we were given in 2004, the proposed groynes, diversion and options for deoxygenation still had some question marks over their effectiveness. These were to be

the subject of ongoing research which was expected to be completed in the course of that year. From what we were told it seemed that:

- There is a possibility that research would conclude the impact of the groynes will be insufficient to merit their construction.
- There were some complex technical issues to be resolved in respect of reoxygenation, primarily ensuring that the chosen means is effective to ensure that virtually all of the oxygen released in the bottom waters of the lake is dissolved, rather than escaping to the surface. In practical terms, the main issue with reoxygenation options may be cost - both capital and operating as determined by the amount of oxygen required.
- The diversion conceptually appeared a feasible option.

RESEARCH

Research in support of the short-term solutions is already committed and underway. Research to underpin longer-term solutions is not underway but is currently being scoped. This will include keeping abreast of and drawing on work in respect of the Lake Taupo catchment as appropriate.

In 2003 two separate applications to the Foundation for Research, Science and Technology, which were seen as necessary in order to develop a better understanding of what was required for longer term solutions, were both declined. One was from the Institute of Geological and Nuclear Sciences (GNS) to gain a better understanding of ground water pathways. The other was from Professor David Hamilton, at the University of Waikato, to assist with environmental modelling.

GNS's lead researcher has advised us that "ground water pathways are the neglected part of the transport of nutrients into the Rotorua lakes. More research is essential to increase understanding of the time lags associated with them and how these will affect future nutrient loads to the lakes".

Professor David Hamilton argues the case for research to develop environmental modelling tools as "the major objective of the proposed research programme is to develop a suite of modelling tools and a protocol that can be used to assess the extent of change necessary to avert or reverse declining water quality in lakes. The tools that will be used for this purpose are lake ecosystem models that range from simple nutrient and water budget estimates through to one- and three-dimensional models that couple lake hydrodynamics and biogeochemistry. The coupled models specifically address one of the difficulties of past lake studies, which has been an inability to understand the way in which linkages occur within systems (e.g., biology-physics)."

In order to gain an understanding of why these projects had been declined, we spoke with the Foundation for Research, Science and Technology. The answer (which we had half expected from previous dealings with the Foundation) was that applications for available research funding in the relevant portfolios considerably exceeded the amount available. The fact that the proposals had been declined should not be seen as any criticism of their quality; it was simply that the Foundation did not have the resources to fund all of the good projects that it received.

The decision can be seen as symptomatic of an issue that government policy advisors are currently seeking to address; the disconnect between government's lead advisors in specific policy areas, and the objectives that the Foundation sets in its funding activities. In this case, there does seem to be a view that the Ministry for the Environment, as the

government's lead policy advisor on environmental matters, should have greater input into the Foundation's funding decisions.

Scientists associated with the research being promoted by EBOP note two significant gaps in current lake water research; the absence of research on shallow lakes where bottom sediments are a major factor in contributing to poor water quality, and the lack of environmental modelling (standard in overseas jurisdictions) capable of predicting the interaction of complex interventions with one another and with the environment they are intended to influence.

LONG TERM

Here, the focus is on setting parameters for land management with the purpose of capping and, ultimately, reducing the export of nutrients from, particularly, farming properties. The Council has promulgated a proposed rule which will make any land use change that would have the effect of increasing nutrient export a discretionary use.

The proposal is a restriction on property rights, especially the rights of land owners whose land is either under developed, or in low nutrient export activities (e.g. forestry) but with the potential of being converted into high nutrient export activities (e.g. dairying or sheep/beef/deer farming) in order to increase income from the land.

As well as introducing a rule for managing nutrient exports, it is clear that a significant proportion of land currently in pastoral agriculture will need to be converted to some other use generating much lower levels of nutrient export. At the time we were writing our report EBOP estimated that, in order to achieve the desired outcomes for remediation of lakes Rotorua and Rotoiti, the minimum level of nutrient (nitrogenous) exports needs to reduce from 692 tonnes per annum to 435 tonnes. EBOP noted that the required reduction could be much greater as a result of increasing loads in the groundwater due to the age spectrum. Virtually all of this would need to come from a reduction in nutrients in stream flows, most of which is from ground water but some of which is from natural "point" sources. The implication is that the great bulk of the reduction would need to come from reducing nutrient exports from pastoral agriculture.

EBOP's land management rule has been designed to provide maximum flexibility. Rather than directing land users on permitted activities, it simply sets a target for nutrient exports with the land user free to undertake whatever activity he or she pleases, so long as the target is not breached.

The major unknown, in developing long term land use management practices, is the transmission process from nutrients released on farm, to nutrients entering lake waters. GNS comments that "the full effect of today's land uses on receiving waters such as lakes won't be apparent until affected ground waters have passed through the ground water system. This will be decades. These long flow paths imply that the ultimate maximum effects of nutrient pollution on streams and lakes will not be reached until after many decades of gradual decline in quality. Likewise, remediation of ground water systems and downstream waters will take correspondingly long times. It is therefore vital for timely management that these time scales be understood and action to protect the system commence." EBOP is currently working on the groundwater age issue and the implications for future nutrient loads.

It also means that, until these processes are fully understood, it is difficult to estimate with a high level of confidence the true extent of the required reduction in nutrient exports, and the associated land use changes required to achieve this. This uncertainty

emphasises both the urgency and the importance of investing in further research to provide a better understanding of the required reduction in nutrient exports, and the desirability of taking a precautionary approach recognising the risk that the reduction ultimately required may be greater than the current estimate.

THE LAKE TAUPO FACTORS

The factors that government saw as relevant, in the case of Lake Taupo, for assessing whether there should be a contribution from the taxpayer were:

- The nationally important status of the lake.
- The scale and urgency of the problem and feasibility of the proposed solutions.
- The cost burden on ratepayers.
- Past national and local policies relating to catchment development and impacts.
- Crown land holdings.
- The Treaty relationship with Tuwharetoa.
- Relevant national policies.

NATIONALLY IMPORTANT STATUS

This factor is clearly intended to focus on the question of who is the beneficiary. The implication is that, if the lake is nationally important, then the beneficiaries are national - taxpayers - rather than simply regional or local.

The Lake Taupo Cabinet paper did not set out any criteria for determining the status of the lake as nationally important. It simply asserted that "Lake Taupo is nationally important for its natural and cultural values"[26].

In order to get an understanding of how the government had arrived at that conclusion, MDL approached the Ministry for the Environment. The Ministry's response included:

"There are no specific national criteria or characteristics that officials use as a benchmark for determining the national importance of lakes or any water bodies. However, an interdepartmental working group of officials are currently working on this policy issue as part of the Sustainable Development Programme of Action".

"The Ministers' decisions around protecting Lake Taupo reflect their perception of how many New Zealanders see the lake. Lake Taupo is the largest fresh water lake in the North Island and is very accessible and visible – being on the main highway south. People view Lake Taupo as an important tourist and holiday destination, and an important recreational and fishing lake, and so on. Lake Taupo is mentioned as an example of an at-risk nationally significant water body in the Government's Sustainable Development Programme of Action."

The response suggests that Ministers were guided by a sense of what the public reaction might be, if government failed to accept responsibility. There is little in the stated reasons that would set Lake Taupo significantly apart from the Rotorua lakes. As examples:

- Collectively, the Rotorua lakes are a more significant resource for recreational fishing than is Lake Taupo (the Fish and Game Council notes that the main

[26] Office for the Minister for the Environment (2003) p2

attraction, in the Taupo area, for experienced recreational fishermen is the streams that feed the lake, not the lake itself).

- The Rotorua lakes are also a very significant recreational resource for small craft. The number of yachts, motor boats and other recreational craft using the Rotorua and Rotoiti lakes is probably much greater than the number using Lake Taupo.
- Lake Rotorua, in particular, is highly visible to a very significant number of airline passengers, many of whom have a very clear view of the lake as they fly in or out of the Rotorua airport. Significantly, this includes a much higher number of overseas visitors than would have an opportunity of viewing Lake Taupo.

There is a further issue, regarding status, that needs careful consideration. If government determines that the Rotorua lakes do not have nationally important status, then it is difficult to see how they could be held to have regionally important status either. Rotorua's tourism industry is largely separate from that of the coastal Bay of Plenty. As a recreational resource, the lakes are an attraction for people living in the coastal Bay of Plenty, but a minority attraction.

In MDL's view, EBOP would have to consider very carefully whether it could regard the lakes as being of regional significance, if government did not see them as nationally significant.

It could also find some difficulty in justifying the expenditure of ratepayer funds, raised from outside the Rotorua district, given the provisions of section 101 of the Local Government Act 2002 which provides that "the funding needs of the local authority must be met from those sources that the local authority determines to be appropriate, following consideration of, in relation to each activity to be funded:

- The community outcomes to which the activity primarily contributes.
- The distribution of benefits between the community as a whole, any identifiable part of the community, and individuals.
- The period in or over which those benefits are expected to occur.
- The extent to which the action is all in action of particular individuals or a group contribute to the need to undertake the activity.
- The costs and benefits, including consequences for transparency and accountability, of funding the activity distinctly from other activities.
- The overall impact of any allocation of liability for revenue needs on the current and future social, economic, environmental, and cultural well-being of the community

EBOP might find that, in the absence of nationally significant status, the community outcomes to which remediation contributed were essentially Rotorua outcomes and the benefits of remediation would arise primarily within the Rotorua district.

In practice, that would force the bulk of the cost of remediation back on the Rotorua community with the quite possible consequence that remediation would prove unaffordable.

In September 2003 the Chief Executive of the Ministry for the Environment forwarded a report to the Minister for the Environment on Lake Rotoiti and other Rotorua lakes. The report included the statement:

"There are no quick, cheap and easy solutions to the problems with the Rotorua lakes, but they are nationally important for tourism and recreation. We believe that the

issue is important enough for central government to be informed and consider possible responses.[27]"

The lakes were also referred to in the Prime Minister's statement to Parliament on 10 February 2004 in which she said:

"Our clean, green and beautiful image needs more than rhetoric to be sustained. That's why we are giving priority this year to strategies for water quality improvements in Lake Taupo and the Rotorua lakes, and to National Environment Standards on freshwater and on air quality.[28]"

SCALE AND URGENCY

The scale of the remediation work appears to be at least on a par with Lake Taupo, especially if remediation/preventive measures in respect of the remaining Rotorua lakes are taken into account.

Urgency is clearly also at least as great as is the case with Lake Taupo. In respect of lakes Rotorua and Rotoiti there is potential for "collapse" of the lakes as a consequence of deoxygenation of lake bottom waters. The state of most of the other lakes suggests that they are nearer to experiencing significant losses of water quality than is Lake Taupo.

FEASIBILITY OF THE PROPOSED SOLUTIONS

This factor covers both technical feasibility and community support.

So far as long term measures are concerned, there is no greater reason to believe that the land use management controls proposed for the Rotorua catchments are any less technically feasible than whatever might be proposed for Lake Taupo (recognising that Environment Waikato has yet to promulgate the necessary land use controls)[29]. From publicly available information, there does appear to be a greater level of uncertainty regarding the timing and quantum of nutrient flows into the Rotorua lakes from pastoral agriculture, partly because of the identified need for further research. However, MDL understands that there may also be some doubt about whether the proposed 20% reduction target for Lake Taupo will actually achieve the desired impact.

Superficially, it does seem that the Rotorua community has not yet achieved a level of community commitment and consensus equivalent to what has been achieved at Lake Taupo. In part, this results from complexity. Lake Taupo is being handled on the basis that there is a single cause and a single solution. For lakes Rotorua and Rotoiti in particular, there are multiple causes and multiple solutions. It should be noted that the present level of agreement in respect of Lake Taupo has taken some four years to reach whereas discussions between EBOP, the Rotorua District Council, the Te Arawa Maori Trust Board and other stakeholders designed to reach an agreement on the remediation of the Rotorua lakes have been underway only since early 2003. The fact that EBOP was

[27] Ministry for the Environment (2003)

[28] Clark, Rt Hon Helen (2004)

[29] this statement needs to be read in context with the timing of the paper on which this presentation is based -- it was prepared in early 2004.

able to develop and promulgate its proposed land management rules within a year illustrates the urgency attached to finding an agreed solution.

From input that MDL received in consultation with key stakeholders, it is clear that there are differing levels of understanding about the nature of the problem, the feasibility of different solutions, and the way that past interventions have worked in practice. This highlights the (difficult) task of trying to achieve a common understanding, between EBOP, the Rotorua District Council, Te Arawa Maori Trust Board and various stakeholders, of what the options are and of the nature of the science underpinning them.

Another factor differentiating Rotorua from Taupo is EBOP's decision to promulgate its proposed land use management controls before agreement had been reached, across the community, and with government. That highlighted the fact that there is "no free lunch" in terms of reducing future nutrient exports. Because the rule was promulgated before agreement had been reached on how the costs, (including opportunity costs) of change should be allocated, it is comparatively easy for different interest groups to see themselves as expected to carry more than their share of the cost of change and other interest groups to be free-riding on that.

It is likely that, in contrast, interest groups in Taupo at the time broad agreement appeared to have been reached may not have fully thought through the potential impact on them as they had not yet seen what land use controls would need to be in place.

At the time the report for EBOP was prepared, MDL had been told that a likely government precondition for assistance with the remediation of Lake Taupo was that appropriate land use controls would needs to be in place. There was a suggestion that this requirement included an understanding that neither farmers around the Lake nor Tuwharetoa would make any objection to the form which those land use controls might take.

It is entirely possible that EBOP's strategy of putting the rule on the table at an earlier stage may prove to have been the better approach as people at least know what they are dealing with.

A further dimension of community acceptance is very clearly the attitude of Maori land owners who are not only substantial owners of productive land, but also hold considerable areas of under developed or undeveloped land (Ngati Whakaue Tribal Lands is a very significant holder of farming land; in addition there are 34 Maori trusts in the Rotorua district affiliated to the Federation of Maori Authorities many of whose lands are un- or under-developed).

MDL understands there is a distinct possibility Maori will regard a land use management control that caps nutrient export at existing levels as the equivalent of a taking without compensation. It will prevent owners from developing their land to its productive potential. In economic terms, it means that their wealth will be frozen at the value of undeveloped land, rather than at the value of land with potential for development.

There are options for addressing this issue. One is to establish a "nutrient export allowance" for each separate property within the catchments and to set those allowances so as to transfer some entitlements from existing productive properties to under or undeveloped land. Clearly this would raise the issue of compensation for properties whose allowance was being set at less than their current export levels. This approach has similarities with the nutrient trading scheme which at the time was being considered

by officials from the Ministry of Agriculture and Forestry and the Ministry for the Environment.

A second approach is to adopt the argument being put forward by the chief executive of the Ngati Whakaue Tribal Lands Trust that the issue should be treated as a matter of macro-economic policy, rather than as a water quality issue. Essentially, what he is saying is that the primary interest of Maori land owners is in using their assets to advance the economic wellbeing of their people. Currently, agriculture represents the best opportunity they have available. A macro-economic approach, focused on creating development opportunities that could be accessed by Maori, could shift the emphasis from agricultural production, with its water quality impacts, to other forms of economic activity.

There does seem to be merit in this approach. For existing land use, for example, it could see the question of cost (compensation) shifting from one of X thousand dollars per hectare to compensate for the lost value resulting from change of use to (say) forestry, to a payment of X thousand dollars per hectare for reducing nutrient export to a defined level. It is also an approach that would be consistent with EBOP's preference for setting rules that allow a flexible, market based approach, rather than dictating what the alternatives should be.

THE COST BURDEN ON RATEPAYERS

In respect of Lake Taupo, the government started with the proposition that a fair division of cost was one third each to be borne by government, Environment Waikato, and the Taupo District Council. It has subsequently been persuaded to pay a higher proportion of an increased cost, accepting that Taupo residents, generally, are less well off than New Zealanders as a whole.

In discussion with officials about the possibility of a government contribution to remediation costs, virtually the first point they made was that EBOP was a wealthy regional council, as the result of its majority shareholding in Port of Tauranga Limited. There is a clear perception that, with this wealth, EBOP can well afford to meet a substantial part of the remediation costs, thus lessening the case for government to do so.

There is a fundamental flaw in that argument. Whilst it is true that EBOP holds significant wealth, it does not follow that drawing on EBOP's wealth to fund remediation costs would be costless to district or regional ratepayers. The practical reality is that the cost of doing so would be met, not by EBOP the organisation, but by ratepayers. The reason is simple. EBOP currently applies the income it receives from its financial investments to offset regional rates. If it diverts part of that income to another purpose, it will need to increase regional rates by an equivalent amount.

The same applies if EBOP uses capital rather than income. Doing so would reduce EBOP's investments and accordingly the income stream it receives from them. EBOP would need to increase rates to make up for the loss of that income stream[30]. There are, in addition, very significant constraints on using EBOP's capital, especially that represented by its shareholding in Port of Tauranga Limited. It cannot unilaterally

[30] In this discussion we are assuming that the alternative of reducing EBOP's expenditure elsewhere by the equivalent of the reduction in the income stream from investments is not a practical alternative. Effectively, we are assuming that EBOP's current expenditure is both needed and efficient.

require the Port Company to return part of the capital as a special dividend (thus preserving EBOP's shareholding percentage) as Port of Tauranga Limited is a listed public company subject both to the requirements of the Companies Act and of the listing rules of the Stock Exchange. Effectively, these prevent EBOP from initiating such an action on a unilateral basis – the right to do so rests with the directors of the company who are required to act in the interests of the company as a whole, and not just in the interests of the majority shareholder.

The alternative of selling down EBOP's shareholding in Port of Tauranga Limited would amount to a further partial privatisation and put at risk EBOP's majority control. We assume that neither EBOP, nor the government, is an advocate for partial privatisation as a contribution to lake water quality remediation.

We conclude, therefore, on the question of using EBOP's wealth that this proposition essentially collapses to an alternative means of regional ratepayers contributing to the cost of remediation. The question to consider, therefore, is those ratepayers' ability to pay.

The emphasis on EBOP's wealth in respect of Rotorua highlights the apparent failure of officials to consider the same issue in respect of Lake Taupo. As with EBOP, the Taupo District Council also holds substantial wealth as the result of infrastructure restructuring/corporatisation during the 1990s. It privatised the council-owned electricity undertakings, receiving approximately $73 million which is being managed as an investment fund by the council, with the income used primarily to offset rates.

That council's draft 2004 LTCCP sought input from its community on the future use of the fund, with an emphasis on continuing the present policy of cross-subsidising rates. The final LTCCP confirmed that approach

According to the LTCCP, the capital in the fund stood at $51 million rather than the original $73 million.

The amount of wealth which EBOP holds, per capita, based on the region's population at the 2001 census, is $1,740. Taupo District Council's per capita wealth, based on the 2001 census, would be $2,316 on the original fund of $73 million and on the present amount of $51 million, $1,618.

The Lake Taupo Cabinet paper noted that 36% of the Taupo population are in decile 1 or 2 for income[31], a statement we interpret as meaning that 36% of the Taupo population are in the bottom 20% of New Zealanders in terms of income.

A report prepared for EBOP, ***Profile 2001: A Socio-economic Profile of the People of the Bay of Plenty Region – Census 2001*** includes an analysis, for each district within the region, of the area's ranking on the index of deprivation, an integration of nine variables from the 2001 census, reflecting eight dimensions of deprivation.[32]

The analysis in the profile shows that both the Tauranga and Western Bay of Plenty districts, although they include areas that are among the most deprived on the NZDep measure, are generally not significantly deprived as compared with the remainder of New Zealand. Western Bay has fewer areas at either the high or lower end of NZDep scores

[31] Office for the Minister for the Environment (2003) p5

[32] Warren, Julie (2002)

as compared with the remainder of New Zealand. Tauranga is broadly on a par with the rest of New Zealand at the lower (more deprived) end of the NZDep scale, over represented in the middle ranges and under represented at the upper ranges.

Rotorua has relatively more areas with high deprivation scores and the Eastern Bay of Plenty is amongst the most deprived areas in New Zealand.

The percentages coming into the bottom two deciles, and the bottom decile, respectively, in each of those four districts are:

District	Percentage in Bottom Two Deciles	Percentage in Bottom Decile
Rotorua	34%	18%
Kawerau	71%	46%
Whakatane	43%	25%
Opotiki	66%	59%

These figures show that deprivation in Taupo is not significantly different from deprivation in Rotorua (although it should be noted that the Taupo figure appears to be based on income alone). Of perhaps greater significance in considering the case for a ratepayer contribution, the analysis shows that the Eastern Bay of Plenty, as an area, is significantly more deprived than Taupo.

In considering ability to pay, this suggests that the Rotorua district is in broadly the same situation as the Taupo district. On this basis, Rotorua ratepayers' collective ability to contribute to remediation should not be seen as significantly different from that of Taupo ratepayers. What does stand out is the issue of ability to pay at the regional level. We have already noted that the suggestion of using EBOP's wealth to contribute to the cost of remediation collapses to an argument that regional ratepayers should pay. The evidence regarding deprivation in the Eastern Bay of Plenty suggests that this argument is at best weak. It is hard to escape the conclusion that, despite EBOP's apparent wealth, the ability of the Bay of Plenty Region to contribute to the remediation of Rotorua lakes water quality is significantly less than the ability of the Waikato region in respect of Lake Taupo.

PAST NATIONAL AND LOCAL POLICIES RELATING TO CATCHMENT DEVELOPMENT AND IMPACTS.

These have already been discussed in the section dealing with the history of agricultural development in the Rotorua District and the role of government. What is clear from the coverage is that central government played a crucial role in the development of pastoral agriculture within the Rotorua catchments.

THE TREATY RELATIONSHIP WITH TANGATA WHENUA

The Lake Taupo cabinet paper recorded a number of matters underway to deal with Tuwharetoa's concerns. They included a recognition that Tuwharetoa is not only a very significant landowner around Lake Taupo, but that it is unable to sell its land. This places an emphasis on finding means of reducing nutrient export from Tuwharetoa owned lands, whilst they remain in the same ownership.

The Treaty related issues in respect of the Rotorua lakes appear to be more extensive than those affecting Lake Taupo. The Crown at the time we prepared our report for EBOP was is in the midst of negotiations with the Te Arawa Trust Board for the return of the ownership of the bed of the lakes to Te Arawa. The negotiations concluded with agreement on vesting legal ownership of the beds of the 13 Rotorua lakes into our together with the payment of a $10 million compensation package and a formal apology from the Crown.

Te Arawa, and MDL understands, Tuwharetoa, are also looking at another aspect of remediation from a Treaty perspective. EBOP's proposed rule 11, and the equivalent rule that Environment Waikato will be required to put in place for the Lake Taupo catchment, will cap nutrient exports at current levels. In Rotorua, as already discussed, that will effectively prevent Maori landowners from developing undeveloped or under-developed land for pastoral agriculture (and for any other use that would increase nutrient export). The same issue arises in respect of Maori owned land currently used for forestry. A nutrient cap will, in practice, remove the option of converting land, currently in forestry, to pastoral agriculture when the trees are harvested. MDL understands that both Tuwharetoa and Te Arawa regard the nutrient cap as potentially the equivalent of a second raupatu or confiscation without compensation.

The current government stance is that it will not compensate landowners for the opportunity cost they will incur because of restriction on future use. That stance is diametrically opposed to what currently appears to be the approach being taken by Tangata Whenua.

The Crown can be expected to argue that the impact on the property rights of Maori landowners is less significant than first appears for reasons such as:

- Any value loss will only occur over time – at the point where land would have been developed or converted from forestry to pastoral agriculture. In net present value terms, that would be significantly less than if the land were currently available for development.
- At least some Maori owned land is quite deliberately held in an undeveloped or underdeveloped state with the Maori owners placing significant cultural and spiritual rather than economic value on the ownership rights.
- There is a potential conflict between Maori economic and Maori cultural interests, especially if optimising the economic interest damages lake water quality and thus the value of the taonga.

This latter point could be picked up as an argument that Maori, knowing the consequences of development, would not want to develop their land beyond the point of sustainability. In turn, this can be expected to focus attention on the development of nutrient export budgets for individual catchments with the crucial property rights issue being how access to that budget is distributed. Such an approach could well lead to agreement between the Crown, regional councils, and Maori that any consideration of loss of property rights should not be based on the theoretical assumption that all land currently owned by Maori would be developed for pastoral agriculture. Rather the focus should be on the proportion of Maori owned land that would be available for development within an agreed nutrient export budget.

There are clearly major Treaty related issues which will need to be resolved between the Crown and Te Arawa. The significance of the lakes as taonga, and the interest of Te Arawa in securing the economic future of its people both suggest that Te Arawa will remain a crucial party in any negotiations with the Crown and that Te Arawa will have its

own separate issues to resolve. This suggests that although Te Arawa will remain an integral part of ongoing negotiations with the Crown, to the extent those negotiations concern Te Arawa's Treaty rights, those are the business of Te Arawa primarily rather than of the district or region as a whole.

RELEVANT NATIONAL POLICIES

MDL assumes that the reference to relevant national policies is to policies such as the government's sustainable development strategy. It may also be intended to incorporate certain of the government's economic development policies such as its tourism strategy.

It can also be seen as a catch all phrase for "anything else that government thinks is significant".

On 16 December 2003 the Minister for the Environment released a press statement announcing a significant commitment to preserving Lake Taupo, stating "the government is committing up to $36.7 million to a joint fund to reduce nitrogen inputs to the lake, with the aim of protecting water quality and clarity"[33]. The statement is worded in terms that suggest a final commitment has been made and carries with it the implication that, in similar circumstances, similar funding will be available.

The government and its advisors were clearly very nervous that the decision to make a financial contribution to protecting Lake Taupo water quality could set a precedent that might become extremely costly. As one official commented to MDL, it was concerned the Lake Taupo decision will result in "every council turning up with its lakes for assistance."

From reading the cabinet paper that preceded the decision, it is clear this nervousness has been somewhat heightened by the perceived need to increase the amount of the government contribution from the figure that had originally been discussed. When government first considered offering assistance, it was on the basis that government, the Regional Council, and the District Council would each contribute one third of the cost. Following that initial decision, the estimate of cost increased to such a level that the Taupo District Council indicated it could no longer meet a full one third. The Minister for the Environment, in her paper to cabinet, commented in this respect that:

> "I acknowledge that increasing the government share from 33% to 45% will increase consequent fiscal risk as there will be other local communities with limited ability to pay for comparable environmental protection initiatives. However, this needs to be weighed against the higher risk of failing to protect Lake Taupo if we cannot reach a mutually acceptable funding formula.[34]"

In a bid to contain the fiscal risk, she then went on to state a set of conditions governing the decision to make a contribution. These were clearly intended to limit the opportunity for other councils to use Lake Taupo as a precedent. The clause setting out the conditions reads:

[33] Hobbs, Hon Marian (2003)

[34] Office for the Minister for the Environment (2003) p6

> "I propose that the fiscal risk be managed through a clear statement that confirms the discretionary nature of the government's contribution which is based on the particular circumstances of Lake Taupo, taking into account …" the factors listed above.

One of those conditions is particularly important for the Rotorua situation given the complexity, and the potential, as a consequence, for different stakeholders to take different views both on causality, and on appropriate solutions (note, in recording these different views, MDL was not endorsing them but merely noting that they exist and dealing with them must be factored into the development of any policy framework).

The crucial condition, in this respect, is the second one "the scale and urgency of the problem **and feasibility of the proposed solutions**".

It is clear from discussion with officials that feasibility has at least two components to it:

- The proposed solutions are technically and legally feasible and capable of implementation (whether they involve engineering works or regulatory interventions).
- They are also feasible in the sense that there is a community consensus in support so that there will be minimal delay or difficulty in the implementation.

At the time we prepared our report for EBOP the government had not yet finally committed to the Lake Taupo solution. Amongst other things, it was still working with the parties to determine that the various conditions precedent could be satisfied. As one example, MDL understands that the Crown was seeking undertakings from farming interests (specifically Taupo Lake Care) and from Tuwharetoa binding on its various landholding entities, that they would not object to whatever regulatory rule Environment Waikato sort to put in place to control land use (the Cabinet paper referred to Environment Waikato's nitrogen regulation being in place by July 2004 with no Tuwharetoa appeal).

What this highlights is the extremely nervous approach which the government was taking to the issue of fiscal risk; the concern that Lake Taupo could become a precedent for a series of very significant claims on the taxpayer. More recently, that concern can be seen as expanding into other related areas of potential claim such as compensation for flood damage. The Crown has had a history of responding positively to claims to assist with making good uninsured damage. The Manawatu and Bay of Plenty floods provide recent examples.

There is evidence that the Crown's willingness to act as ensure of last resort may be under review. The reasons for this include:

- The sheer scale of the potential risk to the taxpayer is very substantial. Competing claims on future government expenditure give the Crown a very strong incentive for managing this risk.

- Typically, when uninsured damage is involved, it reflects either a decision by someone not to incur the cost of insurance, or an unwillingness by insurers to underwrite the risk. In either case for the Crown to act as the equivalent of

insurer of last resort can be seen as a means of increasing potential risk and hence potential loss. If people are confident that the Crown will act to compensate them, then they are likelier to undertake risky investments -- to locate their activities in areas which are flood prone for example. They are also less likely to seek market-based solutions funded out of their own pocket when they can expect a taxpayer based solution funded by taxpayers.

A further indication of the approach which the Crown has been taking in respect of Lake Taupo comes from an address which Barry Harris, a former Chief Executive of Environment Waikato, gave to a meeting of the New Zealand Planning Institute. As reported to MDL, he stated that Environment Waikato believed it had been successful in obtaining government support because it:

- Quantified the problem by source – where were the nutrients coming from and in what quantities?
- Identified possible solutions and established their feasibility (this included developing a partnership approach amongst key stakeholders).
- Was able to estimate the likely costs of implementing the solutions and make acceptable suggestions on how those costs should be met.

The Lake Taupo decision is clearly not definitive in the sense of laying down a set of rules that the Crown will apply on each occasion when it is approached to contribute towards the cost of remediating water quality in a significant body of water. It is however a good insight into the way in which the Crown will approach the question of the extent to which the taxpayer should contribute -- in other words, from a user pays perspective, the extent to which the Crown is prepared to accept that the benefits of remediation represent national public goods which are appropriately funded by the taxpayer.

APPLYING THE BENEFICIARY PAYS PRINCIPLE

Against that background, I turn now to consider the application of the beneficiary pays principle to other potential funders of remediation.

As we have already seen, international practice, especially from Europe and Australia, argues strongly that the governing principle in funding this type of remediation should be the beneficiary pays principle. Applying the polluter pays principle is seen as inappropriate for several reasons including:

- From an economic perspective, it cannot provide any incentive to change behaviour, as the actions concerned have already taken place.
- Imposing what amounts to retrospective liability on individuals for actions that were lawful at the time they were undertaken, and indeed actively encouraged by the governments of the day, is contrary both to general legal principles and to understandings of fairness and equity (we note the exception in respect of contaminated sites. This exception is both widely recognised as being an exception, arguing against any extension, and consistent with economic principles as it does deliver incentives for remediation to parties who, subject to their available resources, would be encouraged to deal with remediation).
- Especially in respect of pastoral agriculture, in an economy such as New Zealand, imposing costs on farmers alone is discriminatory, as the entire community has benefited from the economic growth associated with pastoral agriculture.

Accordingly, any policy framework should be based on the beneficiary pays principle. Three separate issues then arise:

- What are the benefits and who are the beneficiaries?
- In respect of any particular category of beneficiary, how realistic (how equitable) is it to expect them to pay?
- Are there efficient mechanisms available for obtaining payment?

Judgements on both the nature of benefits and who are the beneficiaries are partly objective and partly subjective. They also raise difficulties of measurement, especially in attempting to quantify them in economic or financial terms. As the discussion of short-term, research and long-term factors indicates, there are also significant issues of uncertainty which add to the difficulty both of attributing causality and of establishing legitimacy of any funding measures that impact on specific individuals or groups.

In respect of the Rotorua lakes, one example of the difficulty of identifying specific beneficiary groups is provided by the potential tourism impact. We interviewed two individuals with significant experience in the tourism industry, one of whom had been involved in planning roles both for Taupo and for Rotorua and the other who is chief executive of one of Rotorua's largest tourist attractions.

What came through from those two interviews was that the lakes play quite different roles in the tourism industry in the two areas. In Taupo, tourism planning and activity is focused on the lake. In Rotorua, the lakes are proportionately less significant for tourism. Most international tourists who come to Rotorua do so on package tour arrangements which will typically see them spend between a day and a day and a half in the City. They will come for a mix of Maori culture and geothermal experiences. Most will have no direct contact with any of the lakes.

On that basis, it could be argued that the benefits for the tourism industry in Rotorua, associated with improving or preventing further deterioration in the quality of lake water, are relatively small. However, this analysis misses some significant points including that a small but important percentage of tourists who come to Rotorua do so because of a strong interest in outdoor recreation including fishing, kayaking, white water rafting and other water based sports. The quality of the lake water is important to this group and also potentially important to New Zealand's tourism industry as a whole. As one informant expressed it, what would happen to New Zealand's reputation as a clean green destination if Lonely Planet dumped on us. This informant was closely involved with kayaking and very aware of how international networks quickly spread accounts of adverse environmental impacts – such as the health warnings in place at the time of that interview associated with rafting on the Kaituna.

We have considered whether it is feasible to try and break down benefits, and beneficiary categories, in some kind of micro-fashion such as:

- Fishermen; recreational boaties; residents (perhaps broken down into categories depending on exactly where they are within the district).
- Domestic tourists from within the region, within the upper half of the North Island, within the rest of the North Island, from the South Island, and thus different categories of domestic tourism.
- International tourists and therefore the internationally focused New Zealand tourism industry.

Whilst there may be some theoretical attraction in this approach, it carries with it a number of practical difficulties which suggest that it ought not to be adopted. First, justifying this type of approach requires quantifying, with a reasonable degree of accuracy, the value (or at least the proportion) of the benefits accruing to each sub-set of beneficiary. Quantification not only raises significant measurement problems, it also raises the issue of what is being quantified – in other words, it requires consensus on the nature of the benefits and who the beneficiaries are.

A second difficulty is the consequence of imposing realistic costs (in the sense that they will generate a worthwhile contribution to the costs of remediation), on different sub-groups. Doing so will raise the cost of those activities in comparison with alternatives. Accordingly, there is likely to be real economic loss in applying the beneficiary pays principle in this fashion, as higher costs drive people to use substitutes.

Fishing provides an example. Currently, the Fish and Game Council receives approximately $1 million a year from fishing licences for the Rotorua lakes. A season's licence costs $85. Seeking a contribution from fishermen, which would make a worthwhile contribution to remediation costs, could involve doubling the licence fee. Considerable resistance could be expected, based not just on the quantum of the additional cost, but on what we would term the psychological impact – outright resistance to the idea that what many people regard as a "right" should be exploited by government (which would have to be responsible for imposing the additional cost) in such a way.

It is considerations of this kind that have led other jurisdictions, in applying the beneficiary pays principle, to do so on the basis that the benefits should be regarded, essentially, as public goods – and thus funded out of taxation at the appropriate level (district, regional, national) rather than treating the benefits as a series of private or collective goods and seeking to impose fees on separate groups of users to reflect the presumed value of those private benefits.

TRANSACTION COSTS

Another significant factor which encourages the use of general taxation, rather than separate user fees or taxes targeted to particular beneficiary groups, or particular aspects of causality, is the transaction costs involved in establishing a series of funding mechanisms (especially if the process of doing so requires quantification of the contribution that different causes make, or of the benefits that different beneficiary groups are deemed to receive).

This point is highlighted in a discussion of the various funding instruments used for the American Superfund trust fund. The following extract, discussing transaction costs, is taken from a paper prepared for the Economic Analysis Unit of the European Commission's Environment Directorate, reviewing the American experience as part of the background to the development of the proposed Commission directive on environmental liability. The discussion of transaction costs follows:

> "However, the authors go on to note that there are transaction costs associated with paying taxes. Even as some transaction costs may be eliminated when cleanups are funded through taxation, other transaction costs will be generated if new taxes are created to provide such funding. The level of transaction costs will of course depend upon how the tax is designed. "It takes time and money to administer and comply with any tax. For each individual tax, each firm must fill

> out a full set of forms to calculate a separate tax base. Most of these administrative and compliance costs are fixed, however, and vary little with the tax rate or the amount of revenue raised. In some sense, then, the fewer taxes the better. The Superfund trust fund needs relatively little revenue, yet Superfund legislation has introduced three separate taxes – the chemical feedstocks tax, the petroleum excise tax, and the corporate environmental income tax. The corporate environmental income tax is particularly complicated. It is inefficient in the sense that the annual administrative and compliance costs to which it gives rise may be as large as the revenues it raises. This suggests that a better approach at the inception of the Superfund program in 1980 might have been to use general revenues to create the trust fund. It also suggests that the corporate environmental tax, created in 1986 under the Superfund Amendments and Reauthorization Act, should perhaps have been rethought.[35]"

Accordingly we see no great merit in this approach and consider that it also runs the risk of obscuring the larger benefit issues involved. These are matters such as:

- The potential impact on New Zealand's reputation internationally if we are seen to be neglecting some of our most significant lakes, both in scenic, in recreational, and in cultural terms.
- The implication for New Zealand's own sustainable development policy if it is not capable of finding a means of dealing with environmental degradation on such a significant scale.

REMEDIATION AS A BASKET OF PUBLIC GOODS

We recommend, instead, that the better approach is the one already implicit in the government's emphasis on the status of the lake as nationally important (or not). That is treating the benefits as a basket of public goods - an amalgam of factors including the lakes' importance for tourism and for recreation, their standing as an important cultural and spiritual icon, and as a symbol of New Zealand's commitment to sustainability.

European and, increasingly, Australian practice supports the proposition that for major projects of environmental remediation, responsibility appropriately lies with the taxpayer. The logic is that, when benefits from environmental remediation are considered, they are of such a diverse and diffuse nature, that it is the national community as a whole which best represents the collective of beneficiary interests. In New Zealand, with our more devolved approach towards environmental management, and the very real sense that there will be significant benefits, at least within the Rotorua district, from remediation, there is obviously a strong case that funding for remediation should come not just from the taxpayer but from others. The Rotorua District Council can clearly be seen as the representative of a group which, collectively, will gain significant benefits from remediation.

As has been argued earlier in this paper, it is less clear that the Bay of Plenty region, as a whole, will benefit from remediation in a manner significantly different from New Zealanders generally. Nonetheless, EBOP's significant role in environmental management, and the precedent set in Lake Taupo, will clearly be seen as justifying a regional contribution.

---

[35] McGuigan, Janet Stone (2000) p19. The extract is quoted from a 1995 Brookings Institution and Resources for the Future study "Footing The Bill: Who Pays And How?"

The trend in overseas experience also reflects an increasing environmental consciousness, especially in the European Union, with an emerging acceptance that it is a collective responsibility to address environmental concerns, and not something that can be left to groups who are less able to afford the cost – whether private sector interests, or individual communities within a larger political entity.

In New Zealand, that position has yet to be reached. In MDL's judgement, it may be at least in part because central government has not yet had to confront the stark choice between collaborating in the funding of major environmental remediation, or standing by whilst degradation continues because no other party or combination of parties can afford the costs of remediation.

ABILITY TO PAY

The second factor in applying the beneficiary pays approach is the question of how realistic it is to expect different beneficiary groups to contribute. Here, the focus is primarily on sub-national groupings – at the district or regional level.

Analysis earlier in this paper highlights that the argument that EBOP should be the major contributor, because it holds substantial wealth, is inherently flawed. On close examination, it collapses to an argument that EBOP's ratepayers, many of whom live in some of New Zealand's most deprived areas, should meet the cost. Suggesting that somehow EBOP's wealth is a reason why the ratepayers of (say) Opotiki, Kawerau or Whakatane should bear a substantial load seems inappropriate.

The same arguments apply at the district level, given that significant areas of Rotorua are also in the bottom two deciles of the deprivation index. It should also be noted that Rotorua ratepayers will be making quite significant contributions through, for example, additional sewerage investment.

The strong argument, based on relative rankings in the deprivation index, that both regional ratepayers and district ratepayers are relatively less well placed to meet the costs of remediation than New Zealanders generally (if the instrument to be used is local government rates) indirectly highlights another aspect of policy development internationally. This is the recognition that it is the taxpayer, rather than some subset of the national community, who is best placed to act as insurer in making good environmental damage to the extent it is agreed that it should be funded from a public purse rather than by private individuals or organisations. The taxpayer is seen as best placed, through government, to manage risk and spread the cost equitably.

EFFICIENCY

The third issue to consider in looking at the beneficiary pays argument is the efficiency of the mechanisms available. Here two issues arise:

- Minimising transaction costs – choosing funding means that impose minimal cost in terms of collection and enforcement.
- Choosing means that have a minimal economic cost, in the sense of inhibiting otherwise desirable economic activity.

Funding through general taxation best meets both of these tests. Funding through rates at the regional or local level will generally prove to be as or nearly as efficient as funding

through taxation in terms of the costs of collection (and enforcement). However, rates have significant disadvantages as compared with general taxation for reasons including:

- The fact that they are a wealth based, rather than an income based tax makes them particularly sensitive to political resistance on grounds of ability to pay and fairness. Specifically, there is a much greater risk of crowding out other needed expenditure because of political pressure to keep rates increases to a minimum.
- Increasingly, businesses make location decisions based on comparing the costs (as well as the benefits) of different locations, including what they assume might be the future path of those costs. For districts such as Rotorua (whose economy currently faces a number of structural weaknesses) any increase in location costs for business carries with it a risk of reduced business investment and hence employment.

Accordingly, we conclude that in terms of economic efficiency, general taxation is to be preferred to rates as a means of funding remediation.

5. Conclusion: Summary of Findings

The key points in developing a policy framework within which to consider the question of who should meet the cost of remediating water quality in the Rotorua lakes, including the question of government funding are:

- Costs of remediation should be allocated on the basis of the beneficiary pays principle not the polluter pays principle.
- Applying the polluter pays principle would offend both against the general legal principle that people should not be held accountable for the costs of action which was lawful, and indeed encouraged by government, at the time it took place and against considerations of fairness and equity.
- It is accepted practice that environmental regulation, imposing restrictions on property rights, may be put in place without compensation to the extent that it affects future activity.
- European and Australian policy leans in favour of the view that environmental regulation that would require substantial, and wealth reducing, changes in accepted farming practices, without providing compensation, is essentially retroactive, even though it appears to be affecting future conduct. The reasoning is that farmers are, in a sense, hostage to existing practices as their investments were based on the ability to continue then industry accepted practice.
- The beneficiary pays principle should be applied on the basis that the benefits are essentially public goods, rather than an aggregation of separate private goods. The reasons for this include technical and other difficulties in breaking down and assigning benefits to different groups in a way that enables accurate quantification of those benefits.
- Generally, the international view is that the appropriate beneficiary group, to meet the costs of remediation, is the taxpayer for reasons including the taxpayer's superior ability, as compared with any other group, to manage risk, the relatively low transaction costs of using taxation, and the relative absence of economic disincentives as compared with other instruments.
- There is an alternative for capturing the cost of environmental remediation as a consequence of agricultural activity. This is recovering the costs from consumers generally through a levy on agricultural products on the grounds that, collectively, they benefit from agricultural production and should therefore meet through the price they pay the full costs of that production. That approach can be applied in Europe where a significant part of agricultural production goes to domestic consumers. It could not be applied in New Zealand, as we have no instruments available which would allow us to recover additional costs, over and above the market price of commodities, from overseas consumers.
- By analogy from the European approach of holding consumers responsible, it is New Zealand taxpayers who should meet the cost of remediation. The basic reason is that they are the group within the reach of New Zealand regulatory and taxing powers who have drawn general benefits from agricultural production as the growth and prosperity of the New Zealand economy has been largely dependent on it.
- Despite the arguments that the taxpayer is the most appropriate funder of environmental remediation, it is clear that, in a New Zealand context, both

regional councils and district councils will also be expected to make significant contributions.

- In the case of the district council this is a matter of endeavouring to estimate what are district level benefits as compared with regional or national benefits but offsetting that against ability to pay and the relative inefficiency of using rates as compared with taxes.
- At the regional level it is difficult to see how regional ratepayers, generally, would benefit in ways that are significantly different from the ways that New Zealanders generally would benefit. However, the Regional Council's environmental management role clearly provides an argument that its contribution should be significant.
- Offsetting this, it is clear that the practical reality is that any regional council contribution will be funded directly by ratepayers – the argument that EBOP can afford to contribute from the regional wealth it holds on analysis becomes an argument that ratepayers should contribute as rates increases would be needed to substitute for any payment from the region's wealth.
- High levels of deprivation, especially in the Eastern Bay, suggest that the ability of the region's ratepayers to contribute is significantly less than that of (say) regional ratepayers in the Waikato region in relation to Lake Taupo.

References

Anderson, Robert C; Lohof, Andrew Q (1997, August) "The United States Incentive with Economic Incentives in Environmental Pollution Control Policy" Environmental Law Institute for the Environmental Protection Agency, Washington DC. Retrieved from the World Wide Web: http://yosemite.epa.gov/ee/epa/eermfile.nsf/Attachment+Names/EE-0216a-1.pdf/$File/EE-0216a-1.pdf?OpenElement

Aretino, B; Holland, P; Matysek, A; Peterson, D (2001, May) "Cost Sharing for Biodiversity Conservation: A Conceptual Framework" Staff Research Paper for the Productivity Commission, Canberra. Retrieved on February 25, 2004 from the World Wide Web: http://www.pc.gov.au/research/staffres/csbc/

The Audit Office of New South Wales (2003, May) "Auditor General's Report, Performance Audit: Protecting our Rivers" Sydney. Retrieved from the World Wide Web: http://www.audit.nsw.gov.au/perfaud-rep/Year-2002-2003/Rivers-May2003/RiverWater-May2003.pdf

Bell, B; Elliott, REWE (1993, November) "Aspects of New Zealand's Experience in Agricultural Reform since 1984" Ministry of Agriculture and Fisheries, Wellington. Retrieved from the World Wide Web: http://www.maf.govt.nz/mafnet/rural-nz/profitability-and-economics/structural-change/reform-of-nz-agriculture/httoc.htm

Birks, Stuart; Chatterjee, Srikanta (1992) "The New Zealand Economy: Issues and Policies" The Dunmore Press, Palmerston North

Blackburn, Oliver (2003, December) "Could grant-aid crack pollution from farmland" Environment Agency, London. Retrieved from the World Wide Web: http://www.environment-agency.gov.uk/news/619027?lang=_e&region=&projectstatus=&theme=&subject=&searchfor=&topic=&area=&month=\

Boyd, James (1999, January) "Environmental Remediation Law and Economies in Transition" Resources for the Future, Discussion Paper 99-21, Washington DC. Retrieved from the World Wide Web: http://www.rff.org/Documents/RFF-DP-99-21.pdf

Byron, N; Dwyer, G; Peterson, D (2002, May) "Environmental Problems for Sale – Who Bids?" Productivity Commission in *Connections – Farm Food and Resource Issues, Volume 2, Autumn 2002,* Australia. Retrieved on April 1, 2004 from the World Wide Web: http://www.agribusiness.asn.au/Connections/Autumn2002/ConnectionsAutumn2002.pdf

Centre for Rural Economics Research, University of Cambridge; CJC Consulting (2002, September) "Economic Evaluation of Agri-Environment Schemes" Final Report to the Department of Environment, Food and Rural Affairs, London. Retrieved on April 2, 2004 from the World Wide Web: http://statistics.defra.gov.uk/esg/evaluation/agrienv/chapter2.pdf

Clark, Rt Hon Helen (2004, February) "Prime Minister's Statement to Parliament" Wellington. Retrieved from the World Wide Web: http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=18877

Clayton, John; Champion, Paul (2003, October) "Rotorua Lakes: Plants tell the tale" National Centre for Aquatic Biodiversity and Biosecurity, Presented at Rotorua Lakes 2003: A Public Symposium on Practical Management for Good Lake Water Quality, Rotorua. Retrieved on February 19, 2004 from the World Wide Web: http://www.niwa.cri.nz/rc/prog/aquaticplants/news/

Commission of the European Communities (2002, January) "Proposal for a Directive of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage" Brussels. Retrieved from the World Wide Web: http://europa.eu.int/eur-lex/en/com/pdf/2002/en_502PC0017.pdf

Commonwealth Treasury of Australia (2001, May) "Public good conservation and the impact of environmental measures imposed on landholders" in *Treasury Economic Roundup: Centenary Edition 2001*, Canberra. Retrieved on February 25, 2004 from the World Wide Web: http://www.treasury.gov.au/documents/110/PDF/round5.pdf

Cope, Deborah (2002, November) "Water Reform: Who Pays for the Environment?" Pirac Economics for the National Competition Council, Melbourne. Retrieved on February 25, 72004 from the World Wide Web: http://www.ncc.gov.au/publication.asp?publicationID=162&activityID=41

Council of Australian Governments (2000, November) "A National Action Plan for Salinity and Water Quality" Canberra. Retrieved from the World Wide Web: http://www.napswq.gov.au/publications/vital-resources.html

Dale, WR (ed) (1976) "Land Use Policies" New Zealand Institute of Public Administration, Wellington

Department for Environment, Food and Rural Affairs (nd) "Water Quality: A guide to water protection in England" London. Retrieved from the World Wide Web: http://www.defra.gov.uk/environment/water/quality/guide/water.htm

Department for Environment, Food and Rural Affairs (2002, May) "Proposal for an EU Directive on Environmental Liability" Partial Regulatory Impact Statement, London. Retrieved from the World Wide Web: http://www.defra.gov.uk/environment/consult/liability2/04.htm

Department for Environment, Food and Rural Affairs (2002, June) "Diffuse Water Pollution from Agriculture: the Government's Strategic Review" London. Retrieved from the World Wide Web: http://www.defra.gov.uk/environment/water/dwpa/

Department for Transport (nd) "Establishing a framework for government support for road fuel taxes" London. Retrieved from the World Wide Web: http://www.dft.gov.uk/stellent/groups/dft_roads/documents/page/dft_roads_508355.hcsp

Department of Lands and Survey (1975) "Activities of the Department of Lands and Survey" Wellington

Department of Lands and Survey (1976) "The Department of Lands and Survey 1976-1976 Centennial" Wellington

Department of Prime Minister and Cabinet (2003, January) "Sustainable Development for New Zealand: Programme of Action" Wellington. Retrieved on February 13, 2004 from the World Wide Web: http://www.beehive.govt.nz/hobbs/30199-med-susined-developm.pdf

The Department of Trade and Industry (nd) "Environmental Policy" London. Retrieved from the World Wide Web: http://www.dti.gov.uk/sustainability/ep/ep.htm

Edwards, Geoff; Byron, N (2001, October) "Land Degradation and Rehabilitation: A Policy Framework", Paper presented to the 4th Annual Australian Agricultural and Resource Economics Society Conference on Public Funding and Environmental Issues, Melbourne, 5 October 2001. Retrieved on February 25, 2004 from the World Wide Web: http://www.agrifood.info/Connections/AARES_Symp_01/Edwards.pdf

Environment Waikato Regional Council (nd) "Protecting Lake Taupo: A Long Term Strategic Partnership" Hamilton. Retrieved on February 13, 2004 from the World Wide Web: http://www.ew.govt.nz/policyandplans/taupo/documents/index3.pdf

Environmental Protection Agency (nd) "Clean Water Financing" Washington DC. Retrieved from the World Wide Web: http://www.epa.gov/owmitnet/cwfinance/index.htm

Environmental Protection Agency (nd) "EPA's Clean Lakes Program" Washington DC. Retrieved from the World Wide Web: http://www.epa.gov/owow/lakes/cllkspgm.html

Environmental Protection Agency (nd) "Great Lakes Program Funding" Washington DC. Retrieved from the World Wide Web: http://www.epa.gov/glnpo/fund/2004guid/index.html

Environmental Protection Agency (nd) "Polluted runoff (nonpoint source pollution)" Washington DC. Retrieved from the World Wide Web: http://www.epa.gov/owow/nps/

Environmental Protection Agency (2003, March) "Cleaning Up Polluted Runoff with the Clean Water State Revolving Fund" Fact Sheet, Washington DC. Retrieved from the World Wide Web: http://www.epa.gov/owm/cwfinance/cwsrf/npsfact.pdf

European Commission (2000, February) "White Paper on Environmental Liability" Luxembourg. Retrieved on April 5, 2004 from the World Wide Web: http://europa.eu.int/comm/environment/liability/el_full.pdf

European Commission (2002, January) "Frequently asked questions on the Commission's proposal on Environmental Liability" Brussels. Retrieved from the World Wide Web: http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=MEMO/02/10|0|RAPID&lg=EN

Goulburn Broken Catchment Management Authority (2002) "Goulburn Broken Catchment Management Authority – Dryland Salinity Management Plan" 1995-2001 Review, Shepparton. Retrieved from the World Wide Web: http://www.gbcma.vic.gov.au/files/Dryland%20-%20Chap%206%20Imp%20strat%20details%20brief.pdf

Hajkowicz, Stefan; Young, Mike (2000, April) "An Economic Analysis and Cost Sharing Assessment for Dryland Salinity Management: A case study of the Lower Eyre Peninsula in South Australia" CSIRO Land and Water, Australia. Retrieved on February 26, 2004 from the World Wide Web: http://www.clw.csiro.au/publications/consultancy/2000/cr01-00.pdf

Hamilton, Dr Bruce (2003, December) "A Review of Short-Term Management for Lake Rotorua and Rotoiti" A report for the New Zealand Ministry for the Environment, Wellington. Retrieved on March 17, 2004 from the World Wide Web: http://www.mfe.govt.nz/publications/water/lakes-rotorua-rotoiti-dec03/lakes-rotorua-rotoiti-jan04.pdf

HM Treasury (2002, November) "Tax and the Environment: Using Economic Instruments" London. Retrieved from the World Wide Web: http://www.hm-treasury.gov.uk/media//466CB/adtaxenviron02-332kb.pdf

Hobbs, Hon Marian (2003, December) "Government Commits to Lake Taupo" Beehive press release, Wellington. Retrieved on February 13, 2004 from the World Wide Web: http://www.beehive.govt.nz/ViewDocument.cfm?DocumentID=18647

Horgan, GP (nd) "The Social and Economic Importance of the Rotorua Lakes" APR Consultants, Rotorua.

House of Commons, Environment, Food and Rural Affairs Committee (2002, November) "The Future of UK Agriculture in a Changing World" Ninth Report of Session 2001-02, Vol 1 Report, London. Retrieved on April 1, 2004 from the World Wide Web: http://www.parliament.the-stationery-office.co.uk/pa/cm200102/cmselect/cmenvfru/550/550.pdf

Industry Commission (1997) "Role of Economic Instruments in Managing the Environment" Industry Commission Staff Research Paper, Melbourne. Retrieved from the World Wide Web: http://www.pc.gov.au/ic/research/information/ecoinstr/

Legislative Analyst's Office (nd) "Tahoe Environment Improvement Program" in *The 2002-03 Budget Analysis*, California. Retrieved on April 5, 2004 from the World Wide Web: http://www.lao.ca.gov/analysis_2002/resources/res_4_tahoe_eip_anl02.htm

Marshall, Graham R (1998, January) "Economics of Cost Sharing for Agri-Environmental Conservation" Paper presented to the 42nd Annual Conference of the Australian Agricultural and Resource Economics Society, University of New England, Armidale Australia, 19-21 January 1998. Retrieved on April 5, 2004 from the World Wide Web: http://www.ruralfutures.une.edu.au/text/tpublications/tconfpapers/tconfpapers.htm

McGuigan, Janet Stone (2000, December) "The Potential Economic Impact of Environmental Liability: The American and European Contexts" European Commission, Brussels. Retrieved on May 6, 2004 from the World Wide Web: http://europa.eu.int/comm/environment/liability/comp.htm

Ministry for the Environment (nd) "Contaminated Land" Wellington. Retrieved from the World Wide Web: http://www.mfe.govt.nz/issues/hazardous/contaminated/

Ministry for the Environment (1997) "The State of New Zealand's Environment" Wellington. Retrieved from the World Wide Web: http://www.mfe.govt.nz/publications/ser/ser1997/

Ministry for the Environment (2002, June) "Lake Managers' Handbook: Lake Level Management" Wellington. Retrieved on February 23, 2004 from the World Wide Web: http://www.mfe.govt.nz/publications/water/lm-lake-levels-jun02.pdf

Ministry for the Environment (2003, September) "Report to the Minister for the Environment on Lake Rotoiti and other Rotorua Lakes" Wellington. Retrieved on February 23, 2004 from the World Wide Web: http://www.mfe.govt.nz/issues/water/rotorua-lakes/minister-report.html

Ministry for the Environment (2004, February) "Review of Targets in the New Zealand Waste Strategy" Wellington. Retrieved from the World Wide Web: http://www.mfe.govt.nz/publications/waste/review-targets-waste-strategy-feb04/index.html

Ministry of Agriculture and Fisheries (1996, December) "The Environmental Effects of Removing Agricultural Subsidies: The New Zealand Experience" New Zealand Paper for the OECD Seminar on Environmental Benefits of a Sustainable Agriculture: Issues and Policies presented in Helsinki. Retrieved on March 17, 2004 from the World Wide Web: http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/resource-management/environmental-effects-of-removing-subsidies/agref.htm

Ministry of Agriculture and Fisheries (1997, January) "Agri-Environmental Programmes in New Zealand" Wellington. Retrieved from the World Wide Web: http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/resource-management/agrienvironmental-programmes/httoc.htm

Ministry of Foreign Affairs and Trade (2002, August) "Towards Sustainable Development in New Zealand" New Zealand's report to the World Summit of Sustainable Development, Wellington. Retrieved from the World Wide Web: http://www.mfat.govt.nz/foreign/env/susdevdocs/nzsusdev.html

Mulligan, GE (1980) "Farming Settlement and Development" in *Rotorua 1880-1980*, Rotorua and District Historical Society Inc, Rotorua

Murray Darling Basin Commission and Murray Darling Basin Commission (nd) "Cost Sharing: Who Pays and Who Should Pay?" Information Step E7, Australia. Retrieved on February 25, 2004 from the World Wide Web: ftp://ftp.ndsp.gov.au/pub/general/salinity/tools/salinity_information/basin_sheets/E7.pdf

Office for the Minister for the Environment (2003, December) "Advancing negotiations to protect Lake Taupo" Cabinet paper, Wellington.

Organisation for Economic Co-operation and Development (1994, October) "Conclusions and Recommendations - United Kingdom" Paris. Retrieved from the World Wide Web: http://www.oecd.org/dataoecd/7/54/2452198.pdf

Organisation for Economic Co-operation and Development Environment Directorate (2004) "Highlights OECD Environmental Strategy: 2004 Review of Progress" Paris. Retrieved from the World Wide Web: http://www.oecd.org/dataoecd/57/27/31440465.pdf

Organisation for Economic Co-operation and Development (2004, April) "The OECD Environmental Strategy: Progress in Managing Water Resources" Policy Brief, Paris. Retrieved from the World Wide Web: http://www.oecd.org/dataoecd/26/45/31390326.pdf

Organisation for Economic Co-operation and Development Environment Directorate (2001, September) "OECD Environment Programme Brochure" Paris. Retrieved on April 2, 2004 from the World Wide Web: http://www.oecd.org/dataoecd/3/28/2956842.pdf

Pannell, David J (2001, October) "Public Funding for Environmental Issues: Where to Now?", Paper presented to the 4th Annual Australian Agricultural and Resource Economics Society Conference on Public Funding and Environmental Issues, Melbourne, 5 October 2001. Retrieved on April 1, 2004 from the World Wide Web: http://www.agrifood.info/Connections/AARES_Symp_01/Pannell.pdf

Pannell, David J (2004) "Enhancing the environmental benefits of agroforestry through government policy mechanisms" University of Western Australia, Albany. Retrieved from the World Wide Web: http://www.general.uwa.edu.au/u/dpannell/dp0404.htm

The Parliament of the Commonwealth of Australia Standing Committee on Environment and Heritage (2001, September) "Public Good Conservation: Our Challenge for the 21st Century" Interim Report of the Enquiry into the Effects Upon Landholders and Farmers of Public Good Conservation Measures Imposed by Australian Governments, Canberra. Retrieved on April 1, 2004 from the World Wide Web: http://www.aph.gov.au/house/committee/environ/pubgood/report/report.pdf

Productivity Commission (2000, May) "Productivity Commission Submission to the House of Representatives Standing Committee on Environment and Heritage" Canberra. Retrieved on February 26, 2004 from the World Wide Web: http://www.pc.gov.au/research/subs/environment/#publish

Reno Gazette-Journal (2003, November) "Senate approves funds for Tahoe conservation" Reno. Retrieved from the World Wide Web: http://www.rgj.com/news/printstory.php?id=55891

Ribaudo, Marc (2000, August) "Agricultural Resources and Environmental Indicators: Water Quality Programs" Economic Research Service, United States Department of

Agriculture, Washington DC. Retrieved from the World Wide Web: http://www.ers.usda.gov/publications/arei/ah722/arei6_4/

Rotorua District Council (2002, October) "Rotorua's Patterns of Disadvantage: Rotorua District Indicators of Low Socio-Economic Status 2002" Rotorua. Retrieved on March 17, 2004 from the World Wide Web: http://www.rdc.govt.nz/about+rotorua/statistics+and+demographics/socioeconomic+status.asp

Scottish Environment Protection Agency (2004) "What is Diffuse Pollution" Stirling. Retrieved from the World Wide Web: http://www.sepa.org.uk/dpi/whatis/

Shearer, AR (1974) "New Zealand Agriculture" Ministry of Agriculture and Fisheries, Government printer, Wellington

Sinner, Jim (1992, August) "Agriculture and Water Quality in New Zealand" Ministry of Agriculture and Fisheries, Wellington. Retrieved from the World Wide Web: http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/resource-management/agriculture-and-water-quality/agwatql.htm#P0_0

Stafford, DM (1986) "The Founding Years in Rotorua: A History of Events to 1900" Ray Richards Publisher and the Rotorua District Council, Rotorua.

Stafford, DM (1988) "The New Century in Rotorua" Ray Richards Publisher and the Rotorua District Council, Rotorua.

Tasman District Council (nd) "Current Project: Mapua Cleanup" Nelson. Retrieved on April 4, 2004 from the World Wide Web: http://www.tdc.govt.nz/projects.asp?project=Mapua+Clean+Up&ID=3&story=926

Taylor, Pamela (2003, March) "The need for environmental liability" Water UK, Speech, London. Retrieved from the World Wide Web: http://www.water.org.uk/index.php?cat=3-2192

The Treasury (2003) "Supplementary Estimates of Appropriations for the Government of New Zealand for the Year Ending 30 June 2003: Vote Environment" Wellington. Retrieved from the World Wide Web: http://www.treasury.govt.nz/budget2003/suppestimates/supp03envir.pdf

Warren, Julie (2002, December) "Profile 2001: A Socio-economic profile of the People of the Bay of Plenty Region - Census 2001", CRESA for Environment Bay of Plenty, Whakatane. Retrieved from the World Wide Web: http://www.boprc.govt.nz/media/pdf/2002-03%20Profile2001Final%20Report%201Dec021.pdf

The Wentworth Group of Concerned Scientists (2002, November) "Blueprint for a Living Continent: A Way Forward" World Wide Fund for Nature Australia, Sydney. Retrieved on April 19, 2004 from the World Wide Web: http://www.ccsa.asn.au/Blueprint_for_a_Living_Continen.pdf

The West Coast Regional Council (2002, August) "Contaminated Sites Management Strategy" Greymouth. Retrieved from the World Wide Web: (http://www.wcrc.govt.nz/council/publications/Hazards/Contaminated%20Sites%20Strategy.pdf

Wilson, Hon Margaret; Horomia, Hon Parekura (2003, December) "Te Arawa lakes settlement offer" Beehive press release, Wellington. Retrieved on February 13, 2004 from the World Wide Web: http://www.beehive.govt.nz/wilson/arawa/home.cfm

The World Bank Group (nd) "Domestic Environment Law: Concepts and Issues" Washington DC. Retrieved from the World Wide Web: http://www4.worldbank.org/legal/legen/legen_domestic.html