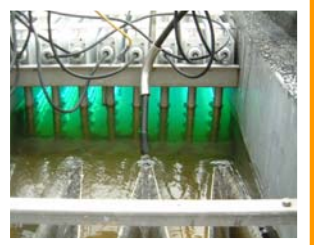


**The Sustainable Evaluation
of the Provision of Urban
Infrastructure Alternatives
using the
Tangata Whenua Mauri
Model
within the
SmartGrowth Subregion**

July 2003



EXECUTIVE SUMMARY

In environmental, cultural, social, and economic terms, sustainable urban water infrastructure is developed and operated in harmony with natural water cycles and water catchments. Integrated holistic management is required that uses timeframes that exceed the 50 year scope of the SmartGrowth subregional strategy. The timeframes applicable should be at least “the mokopuna of the mokopuna” or 150 years.

These approaches therefore need to:

- Maintain sufficient water flow to support ecosystems
- Increase water use efficiency and decrease wastage
- Reduce or eliminate wastewater flow
- Reduce or eliminate stormwater flow
- Encompass the views of Tangata Whenua and the General Community as it will be represented in the future development of the subregion

Maori have always valued water as a taonga. The Waitangi Tribunal reports for the Mohaka River report (1992), Te Ika Whenua report (1998), and the Whanganui River report (1999) demonstrate this. In these reports it is concluded that the rivers and tributaries within the rohe of these hapu were and are taonga of the Tangata Whenua.

Water and water bodies such as rivers, lakes and wetlands, have their own mauri which it is important for Tangata Whenua, as kaitiaki, to protect from pollution, degradation and damage. Rivers, lakes and wetlands are also key elements in the identity, whakapapa and mana of iwi, hapu, and whanau. (Parliamentary Commissioner for the Environment, *Beyond Aging Pipes. Urban water systems for the 21st Century* – April 2001).

Mauri is the central concept / element that this evaluation model uses to identify Tangata Whenua perceptions of the sustainability of various techniques under consideration for the proposed Papamoa East development. The Mauri model has a strong foundation in the traditional Tangata Whenua values within the subregion and also parallels the current policy direction being taken by Central Government. This enables a direct comparison between the results of a conventional analysis of the techniques available and the results based on analysis of impacts on mauri within the Mauri model.

The results identify significant differences of opinion with regard to a repetitive theme. The use of water to transport human excrement and the discharge of any waste stream into receiving waters are considered both culturally insensitive and environmentally unsustainable.

The conclusions of this report are that further work is necessary to identify the potential solutions available from alternative technologies in collaboration with Tangata Whenua and Waitakere City Council using research developed for the NORSGA project.

To adequately incorporate Tangata Whenua aspirations into the future Growth Strategy for the subregion, the SmartGrowth Joint Committee should consider the following actions:

1. That the Project Management Team, Tangata Whenua and the Services Project Team incorporate the finding of this report into the final SmartGrowth Strategy;
2. That the Mauri modelling and the infrastructure scenarios identified in Section four (4) of this report be rerun through the Harrison Greirson Consultants analysis programme for the Papamoa East development;
3. That the final SmartGrowth strategy establish stretched targets that implement changes to the current management, design and timeframes for wastewater and water supply infrastructure;
4. Adopt stretched targets that define the proportion of disposal to land from current infrastructure, new development, and overall that is expected at five yearly intervals;
5. That Tangata Whenua are involved in further research into the feasibility of alternative wastewater infrastructure systems and kept informed about national projects;
6. That a Tangata Whenua pilot project on alternative wastewater treatment systems be established within the subregion as part of the SmartGrowth implementation plan.

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1. Introduction

1.1. SmartGrowth

The physical land requirements for infrastructure services for future growth in the subregion will have major impacts on Tangata Whenua resources, cultural heritage and the environment. This will directly impact on the resource development and protection needs of Tangata Whenua within the SmartGrowth project area. These issues have been reiterated at many of the Tangata Whenua Marae workshops in September 2002, March 2003 and are discussed in the “Feedback from the Tangata Whenua Marae Workshops on the Three Growth Alternatives, June 2003”.

SmartGrowth would undertake a comprehensive infrastructure costing exercise to taking into account all the key infrastructure provisions within the subregion using internal resources supplemented by specialist outside assistance during phase four of the project.

Infrastructure service parameters are being developed by the Services Project Team for SmartGrowth to consider in the costing and evaluation phase of the project. Future management of the projected growth for the next 20 and 50 years are critical issues for Tangata Whenua.

Tangata Whenua recognise that the provision of infrastructure services within the subregion are key indicators of future growth and development and that they need to take a proactive approach to mitigating the effects on their Taonga and the Environment.

This report focuses on the infrastructure water management issues from a Tauranga Moana Tangata Whenua perspective. Mahi Maioro Professionals were engaged to provide independent professional engineering expertise and experience to investigate the SmartGrowth urban infrastructure service implications of growth from a Tangata Whenua / Maori perspective.

The SmartGrowth project has endeavoured to support the need to provide an appropriate level of information to facilitate a quality decision-making process.

Mahi Maioro will provide a formal response to the “SmartGrowth Wastewater Investigations – Overview on Issues of Land Application vs Ocean Discharge Report, March 2003” by The Montgomery Watson Harza (MWH) and their earlier report “Appendix 2: Detailed Assessment of Short-listed Options, August 2002”.

1.2. Tangata Whenua Principles and Values.

The Tangata Whenua representatives within the SmartGrowth structure have provided the direction and guidance from a local perspective to Mahi Maioro on the values base for the Mauri modelling of this report.

Te Runanganui o Tauranga Moana encapsulated the philosophy of the Combined Tangata Whenua Forum with the phrase “Kia Tu Pakari ai Tatou” or standing strong in unity on the principles and values of our Tipuna. These are principles and values that are inherent to Tangata Whenua and Maori that predates the Ocean voyages and relate to the creation of time and the world of Ranginui & Papatuanuku. The culture philosophy, spirituality and interrelationship with the land and environment are central to Maori developing localised social practices and controls.

1.3. Te Tiriti o Waitangi

The Treaty of Waitangi provides a framework from which Tangata Whenua can identify their taonga, cultural principles and values to engage in meaningful discussions with other New Zealanders. The Treaty of Waitangi has been included into 30 separate pieces of legislation since 1975.

The Local Government Act 2002 (LGA), Section 4 provides recognition of the Crown responsibilities to the principles of the Treaty of Waitangi for local authorities are required to facilitate the participation of Maori in their local authority decision-making process as required in Parts 2 and 6 of the Act.

The Resource Management Act 1991 (RMA) provides the trilogy of linkages to tino rangatiratanga of Maori / Tangata Whenua to their ancestral land, water sites, waahi tapu and other taonga in Section 6(e). The customary practices of the haukainga or local people as kaitiakitanga (stewards) and the mauri of the haukainga or the intrinsic values of the ecosystem are recognised in Sections 7(a) & (d) of the RMA. This is indicative of the value these processes have in the sustainable management of the environment.

These pieces of legislation provide principles and direction for statutory bodies in managing their relationships with tangata whenua and the development of sustainable environmental practises.

It is therefore appropriate for Tangata Whenua to seek an alternative model for the evaluation of infrastructure alternatives, which better represents Tangata Whenua principles and values.

1.4. Engineering Design

In the engineering environment the Mauri model needs to identify and explain the different planning and engineering priorities resulting from practitioners that develop solutions from different cultural backgrounds. That is the actual policy or engineering design can be developed consistently, however the choices made regarding which options are investigated and developed further are more important and these choices are strongly influenced by the person's background.

For this reason the Mauri model has been developed based on assessment of the mauri of four central aspects of our eco-system. This model was presented to the Combined Tangata Whenua Forum and the Infrastructure Team 8 May 2003.

The MWH report on evaluation of sustainable techniques provided a suitable opportunity to test the Mauri model and check consistency with Tangata Whenua ideologies. Therefore this report provides an alternative perspective on the range of sustainable techniques being considered for the provision of infrastructure for the proposed urban development of Papamoa East. The Mauri model has been used for evaluating the techniques from the Tangata whenua perspective.

1.5. Researching Future Alternative

The following proverb demonstrates the need for people to continue to move forward in search of new alternatives for the sustainability of the people and the environment within the Western Bay of Plenty.

“Kimihiā katoa nga putake o te kaupapa,

Ingia, I kitea, kimihiā te rongoa”

“Searching out all aspects of a challenge or problem faced,

leads to an enhanced understanding and hence
the solution to the problem”

2. Background

2.1. England 1855

The issue of appropriate disposal of human effluent has been the focus of research for more than one hundred and fifty years. When water based transport and disposal of effluent was being used in the 19th century, a paper by scientist James Prescott Joule in 1855 proposed that waste from London should not be dumped into the Thames through open drains, but collected in tanks under each street, and transferred by force-pump to carts to take it to the rail system, and to the farms.

Early in the 20th century, the British Royal Commission (1898 to 1915) into Sewage Disposal recommendations led to the adoption of a narrow range of sewage options. This happened almost 100 years ago on the other side of the world, however it has formed the basis for predominant practice in many countries of the world including New Zealand. This approach continues to be promoted as the most efficient and effective approach for dealing with human effluent today.

2.2. Aotearoa

Given that land based disposal was being advocated so long ago, does the consideration and adoption of land based disposal in recent times really indicate that much significant progress has been made or that much effort has even been applied to developing the alternatives available?

Is this as far as alternative approaches to the disposal of human effluent have come in 150 years? Certainly the discharge of treated effluent onto land at Rotorua, Taupo and Levin attract a significant amount of scrutiny. Proponents for the discharge of wastewater to water bodies are quick to point out problems that have been experienced with these systems.

What is not acknowledged however is that there are no water based disposal examples in New Zealand that have not had problems in the past and several territorial authorities continue to fail to meet the environmental standards required in their resource consents. Certainly most have breached resource consent conditions unintentionally as a result of plant failure or loadings that exceed their design capacity.

A New Zealand wide survey of Local Authority approaches to municipal wastewater treatment and disposal (Burkhardt Macrae, 2002) found that increasing pressure from public and government is driving the industry to provide higher standards of treatment and more appropriate methods of disposal. Trends have been identified that indicate increased use of land-based treatment and disposal with a move away from discharges to water bodies. In particular the research identified that planned (2010) flow discharged to ocean will reduce by 12%, flow discharged to rivers, lakes

and estuaries will reduce by 27%, and flow discharged to land or wetlands will increase by 300% to one fifth of the total surveyed flow.

2.3. International Trends

A recent study of international trends (18 countries) in stormwater management (Marsalek & Chocat, 2002) suggests that there is widespread international acceptance of a holistic approach to stormwater management promoting sustainable urban drainage systems.

“All national reports share a common vision with respect to the basic philosophy of coping with stormwater problems – by means of a holistically based management, rather than continuing the traditional expansion (or neglect) of urban drainage systems.”

This study goes on to conclude that best management practice incorporates:

- Preserving water balance
- Preventing entry of sediment and pollutants into stormwater
- Emphasising source controls and preventing runoff generation
- Adopting green infrastructure such as ponds, wetlands, swales and infiltration sites
- Maximising public awareness, education, and participation

Recognition of the real value of potable water is being reflected internationally in project case studies promoted by the World Business Council for Sustainable Development. These studies feature several examples where significant economic savings have resulted from reductions in potable water use on industrial sites through collection and use of stormwater, separation of wastewater streams, and treatment and reuse of greywater. This approach stems from the realisation that waste streams from industry should be viewed as a mixture of the semi-processed raw materials that enter the process and therefore are a recoverable source of some of those raw materials. This approach is more consistent with indigenous thinking in that the Tangata Whenua have not traditionally considered waste stream as being useless, but rather that wastes of different types had physical and spiritual attributes such as their associated tapu and could therefore have value in either context.

The global examples identified reflect some of the sustainable techniques for the provision of urban infrastructure that have been identified in the report for proposed Papamoa East development. The pricing, regulatory, and education techniques identified are actually implementation issues. Other techniques represent current best practice and should be adopted automatically in any new development. In the Papamoa East study these are assessed alongside the other sustainable techniques. While all techniques have been considered it is suggested that

only the remaining techniques are relevant for comparison. This is because analysis of all the techniques is considered to cloud the actual comparison between current practice and actual alternatives, which is in fact the purpose of the study.

Finally to quote the New Zealand Waste Strategy (Ministry for the Environment March 2002):

“Maori have a unique perspective and role in waste minimisation and management. They have **played an important role in pushing change in the area of wastewater treatment and disposal...** As New Zealand moves towards zero waste Maori are expected to become more active in waste management planning and waste prevention. **Decision-making must allow for direct Maori input into policy, standards and guidelines, monitoring and evaluation,** and Iwi consultation in preparing waste minimisation and management plans.”

3. The Tangata Whenua Mauri Model

3.1. The Mauri Evaluation Model

The Mauri model is based on four circles that represent interactive aspects of the ecosystem. These aspects have been adopted from the Resource Management Act 1991 and the Local Government Act 2002, and are identified as the effects associated with a particular process or technology.

<u>Local Government Act 2002:</u>	<u>Mauri Model Equivalent:</u>
➤ Economic	➤ Individual
➤ Social	➤ Society
➤ Cultural	➤ Hapu
➤ Environmental	➤ Environment

The Tangata Whenua evaluation is based on whether the option is identified as enhancing, diminishing, or neutral for the mauri of the aspect being considered. The impact on the mauri is assessed independently from the weighting applied to that aspect. Some techniques have been split into two options where that technique groups two or more dissimilar factors in terms of the effect on mauri.

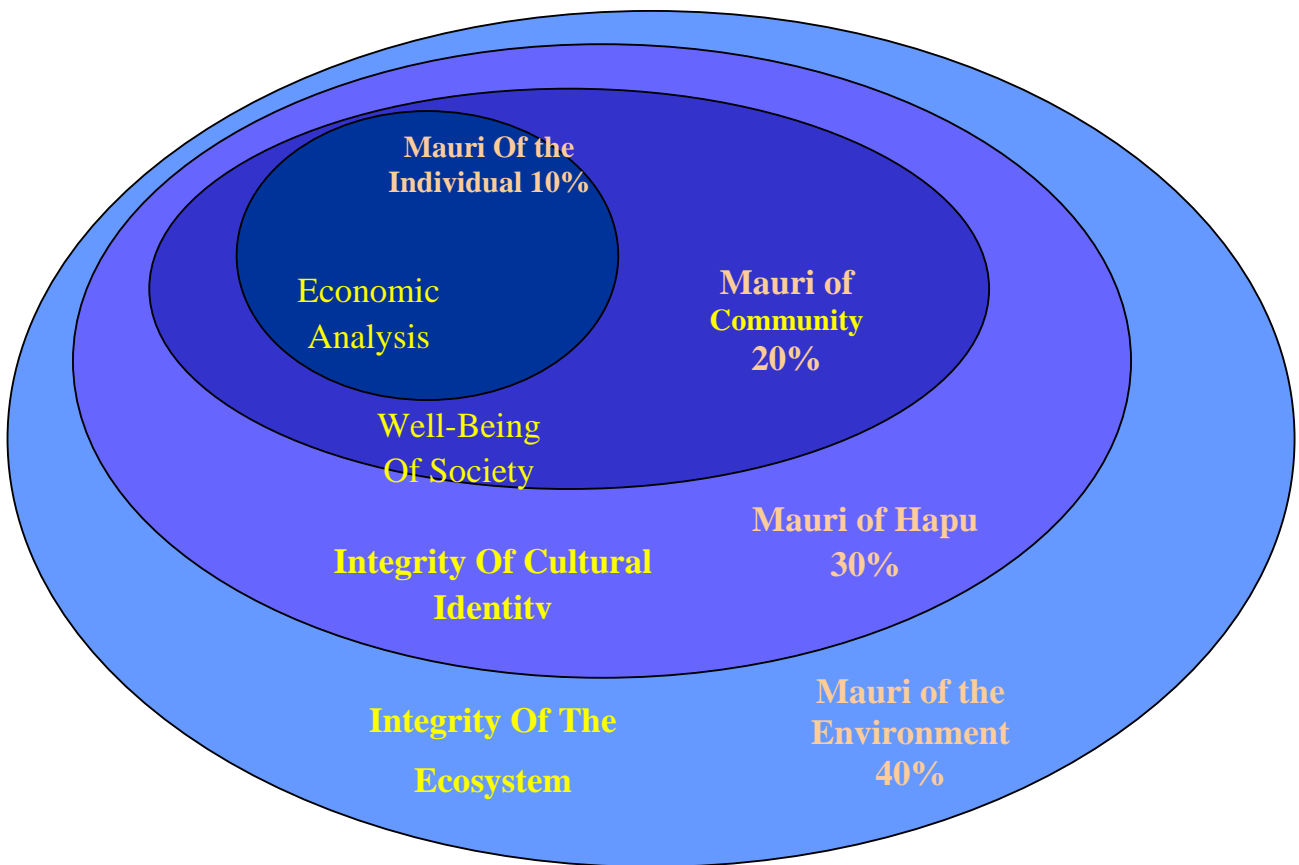
There are five ratings for each aspect. A rating of 4 is considered an acceptable technique that is considered as enhancing mauri and therefore totally sustainable. A rating of 2 is neutral, and a rating of 0 means that the technique is considered to be diminishing mauri and therefore unacceptable and unsustainable.

Unsustainable		Neutral		Sustainable
0	1	2	3	4

The earlier MWH evaluation has used the categories: economic, social, environmental, community health, functional/technical, and Tangata Whenua issues. The Mauri model has therefore been developed as a tool to investigate the differing value systems of the Tangata whenua and Pakeha. The criteria adopted for the Mauri model have taken precedence as they are identified in the “Sustainable Development for New Zealand Programme of Action 2003” regarding achieving sustainable development. Specifically it requires taking account of the social, economic, environmental and cultural effects of our decisions.

The model is represented diagrammatically below as the cumulative Mauri of each individual element of the total ecosystem, which is used as an environmental indicator for the health of Tauranga Moana by the Tangata whenua.

The relative weighting for each aspect has been chosen based on the Combined Tangata Whenua Forum's understanding of traditional practices or tikanga and how these relate to our ecosystem. The environment is considered to be the total sum of all of the individual aspects being assessed and is therefore given the highest weighting of the four other aspects. In particular the environment encompasses culture as demonstrated by the tikanga of rahui. A rahui or prohibition is placed on an area or resource when its mauri is being jeopardised by overuse or some other significant event. This process prioritises the environment ahead of the other aspects until the mauri of that area or resource has recovered.



3.2. Weightings for Aspects

In terms of hierarchy the mauri of the hapu takes precedence over society and the individual. This is because of the relationship that exists between the Hapu and specific whenua. This relationship is permanent and established by whakapapa in the context of the Hapu practice of identifying with geographical features of their specific environment. This relationship is eternal and the relationship to the landscape is central to the identity and mana of the hapu. The relationship that society at large, or an individual has with the environment is more transient than this traditional relationship.

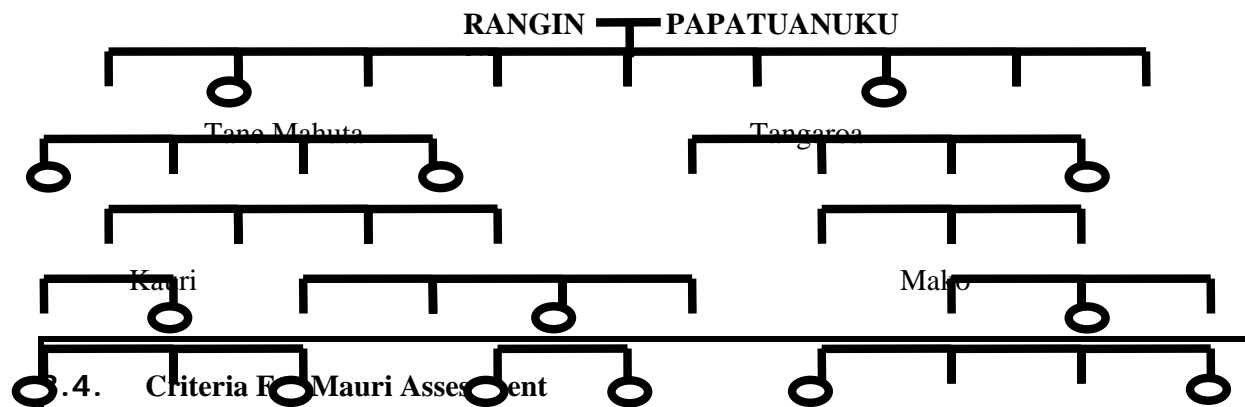
The mauri of the community or well-being of society takes precedence over that of the individual. This is demonstrated in the sacrifices made by individuals to ensure the security of society and hapu. Examples of this are the significant commitment of time and resources made by our Rangatira on behalf of Hapu to counter the impact of external influences on the environment.

3.3. What is Mauri?

The concept of mauri is central to indigenous beliefs regarding the environment. Mauri is the essence that has been passed from Ranginui and Papatuanuku to their progeny Tane Mahuta, Tangaroa ma, and down to all living things through whakapapa in the Maori notion of creation. Mauri is considered to be the essence or life force that provides life to all living things. Water and the land also have mauri. The concept is central also in the context that whaikorero is often begun with the phrase *Tihei Mauri Ora*. This is literally interpreted as the ‘sneeze of life’.

Mauri is also the binding force that holds together the physical being and its spirit. This binding force is no longer able to hold the physical and the spiritual parts together when something dies. Therefore the danger in proceeding with actions, which diminish the mauri of aspects of the ecosystem and environment, is that at some point the weakening of the mauri will lead to the death of that aspect.

Mauri establishes the inter-relatedness of all living things. The linkages between living things within the ecosystem are based on the whakapapa or genealogies of creation. This establishes the basis for the holistic view that Tangata Whenua have of the environment and our ecosystem.



3.4.1. The Mauri Of The Environment

This is effectively measuring the integrity of our ecosystem. The mauri of the ecosystem is directly impacted upon by the state of the environment. The state of the environment is considered by the Tangata whenua to reflect its mauri. This holistic perspective of indigenous peoples is supported by Section 7(d) of the RMA that identifies the intrinsic values of ecosystems as being a matter for which practitioners shall have due regard.

The hapu was held the traditional level for resource management and control as kaitiaki. The



Figure 1 This is a viewed from Tamapahore East to Mauao, the landscape has changed to an ocean of roofs.

Therefore the effects of a specific sustainable technique need to be considered in terms of the effect on the waters within a specific catchment, and also the related impacts on harbours and the moana. The Tangata whenua have also stated that water is a taonga over which they have kaitiakitanga. Further, cross rohe transfer and disposal of wastewater is a significant concern.

3.4.2. *The Mauri Of The Hapu*

This is measured in a variety of ways:

- The state of the environment that a particular hapu have mana whenua over reflects on their mana and their authority to continue in the role of kaitiaki for that rohe or catchment. This is reinforced in clause 7(a) of the RMA 1991. The Waitangi Tribunal Kaituna Report (Wai 4) demonstrates the challenge made by Ngati Pikiao to prevent the discharge of sewage into the headwaters of the Kaituna River in 1984. The Tangata whenua have stated that the actions to protect the waters of the Kaituna at its source shall be continued along its watercourse to its connection with the moana. Further the mauri of the hapu is related to the mauri of the moana.
- The condition of the environment that is passed on to future generations is most important and can be demonstrated in whakatauki referring to nga whakatipuranga.



Figure 2 Tamapahore Papakainga, a view of the Kaumatua whare from State Highway No 2.

- The state of the environment influences the ability of a hapu to manaaki their visitors both on their marae and in their homes. Case law regarding *Te Runanga O Taumarere vs. Northland Regional Council (NZRMA77)* demonstrates the importance of this practice.
- The ability of tohunga to teach traditional practices associated with weaving, customary food gathering, or carving is also dependent on the resources being available from the rohe. This is raised by *Te Runanga O Ngati Pikiao v Minister for the Environment* in 2000 (NZLR). The Tangata Whenua have emphasised that the mauri of cultural resources shall be protected.

The Maintenance of the knowledge base for the hapu is linked to the physical landscape and its appearance as the whakapapa of the hapu includes the place names within the rohe. Refer TV3 Network Ltd v Waikato District Council 1997 (NZRMA 539). The mauri of areas of cultural significance is to be protected, no infrastructure on ancestral sites.

These factors among many others impact directly on the mauri of the hapu.



Figure 4 – A viewed from Tamapahore Marae with Papamoa housing in foreground.

Community well-being includes most aspects of day-to-day life such as recreational access to parks, forests, beaches, reserves, rivers, lakes, estuaries and the ocean or opportunities for employment. This aspect of well being is reasonably well represented by Local Authority decision-making in their current capacity of providing local government although historically this has taken place in a relatively narrow consideration of issues that relate to the community at large.

3.4.4. *The Mauri Of The Individual*

This is a measure of the direct personal effect that a specific technique will have on the individual in terms of affordability, his or her wairua, access and use of resources and cultural identity. The

way that this is perceived varies from individual to individual. The relevance of the state of the environment and the status of the hapu are taken into account under these specific considerations. The health and well-being of the individual and the access and use of resources are taken into account within the context of the mauri of the community. Thus the direct personal effect is how the nuclear family is affected and this is primarily measured in economic terms in today's world.

Therefore it may be considered that the impacts of infrastructure services on the individual are:

- as levied directly in terms of individual financial contributions (Development Impact Fees) towards the capital cost of a reticulated water supply for an existing community
- through a portion of rates used to repay long term borrowing by council
- as a component of the purchase price for a section in a new subdivision.

This tends to be the level of analysis best understood when considering the options available for a technological solution of an infrastructure requirement.

4. Analysis Using Mauri Model

There is general agreement with regard to the sustainability of techniques associated with non-structural demand management (pricing, regulatory and education) strategies. These are primarily associated with the implementation of specific options however and do not assist with understanding the fundamental differences in perspective of the Tangata Whenua. Appendix 2 shows the results of the analysis using the Mauri model.

The Comparison of the results for the water supply options demonstrates general agreement with the exception of all 'flush' uses of water, which achieves very low ratings for sustainability. The highest sustainability rating for flush toilet use of water is 40% and this is using treated wastewater. Typical ratings are between 5% and 30% while MWH rates these options between 67% and 92%.

The other significant difference in sustainability ratings is with respect to the use of treated wastewater and stormwater for irrigation. These approaches rates well using the Mauri model as it supports the philosophy of disposal to land whereas the MWH analysis rates these options between 25% and 67%.

Comparison of the results for the wastewater options demonstrates some agreement however a general trend is that while the Mauri model rates composting systems higher in terms of sustainability, it also rates all reticulated systems lower, specifically the traditional reticulated pipe in pipe out approach which rates only 17.5% for sustainability using the Mauri model compared with a rating of 75% in the MWH report.

Comparison of the results for the stormwater options demonstrates a high level of agreement with the exception of reticulated stormwater and tertiary treatment of stormwater before disposal. Both of these options rate 30% for sustainability using the Mauri model whereas MWH rate these at 59% and 75% respectively. This demonstrates the relatively limited recognition of the impacts that disposal of stormwater to water bodies has. These impacts interfere significantly with the local receiving environment during standard conditions however of more concern is the fact that these approaches have catastrophic impacts in flood events due to the flushing effect through the system.

Further analysis is possible once the 'best practice' approaches for specific options are eliminated. This yields the results shown in appendix 3. The significant result is the emphatic differences of perspective regarding the suitability and sustainability of discharges to water bodies. This difference is noted in all three option groupings of water supply, wastewater, and stormwater management.

Comparison with table 5 of the MWH report indicates that the different perspectives held by Tangata Whenua significantly influence the scenarios that would be chosen for further analysis. A preliminary assessment of several scenarios is provided in the next section of this report.

5. Potential Scenario Analysis

5.1. Te Pae Tuatahi: Human Effluent Without Water

This scenario considers a greenfields development using ecologically engineered zero-discharge systems or composting toilet technology. The sustainable outcomes from this scenario could be expressed as follows:

1. 1/3 less potable water required (\$1.1M savings on reticulation estimated)
2. 1/3 less wastewater to be treated (\$1.5M savings on collection estimated)
3. Reduced volume potable water treatment (alternative less expensive sources become more viable)
4. Reduced volume of wastewater treatment (larger reserve capacity at plant)
5. Dry vault cost is one-off up-front per dwelling (develop state of art design)
6. Education is required on the advantages and use of composting toilet systems
7. Contracted collection of treated solids can be established
8. Extraction method and access provision become a dwelling design constraint
9. Reduced volume of solids for treatment and disposal (less cost / complexity)
10. Different rating basis is required to avoid cross-subsidisation of treatment cost
11. Culturally acceptable to Tangata Whenua

RECOMMENDED ACTIONS:

- Re-run Harrison Greirson model without “flush” component to get costing for sanitary sewer and water supply infrastructure without pipe size increases.
- Document improved dry-vault options and develop technical solutions for costing (state of the art design).
- Check cost savings with regard to water supply and treatment plant infrastructure.
- Stipulate Dry systems mandatory in greenfields development unless satisfactory treatment and disposal on-site.

5.2. Te Pae Tuarua: Catch And Use Rainwater

This scenario considers greenfields or existing development adopting rainwater collection and storage for washing machines and garden irrigation. The sustainable outcomes from this scenario could be expressed as follows: 1/3 less potable water required (\$0.5M further savings on reticulation estimated)

1. 1/6 less wastewater to be treated (\$1.0M further savings on collection estimated)

2. Reduced volume of potable water treatment (alternative sources may become viable)
3. Reduced volume of wastewater treatment (resulting larger reserve capacity at plant)
4. Water storage and reticulation cost one-off up-front per dwelling
5. Uses existing technologies and bulk contract opportunities for tank purchasing / installation
6. Different rating basis is required to avoid cross-subsidisation of treatment cost
7. Culturally acceptable to Tangata Whenua

RECOMMENDED ACTIONS:

- Re- run Harrison Greirson model without water requirement to get costing for sanitary sewer and water supply without pipe size increases.
- Cost alternative water storage and reticulation options.
- Check cost savings with regard to water supply and treatment plant infrastructure.
- Stipulate mandatory rainwater collection and storage in greenfields development and incentives retrofits in existing developments.

6. Discussion

The primary drivers in decision-making regarding contemporary societies infrastructure demands are financial viability and cashflow constraints. History has shown however that past decision makers could now be considered ‘penny wise and pound foolish’ in the context of decisions such as those made around Auckland’s wastewater solutions of the 1950s. The recently completed sewage plant replacement, which replaced the original plant and 250-hectare oxidation ponds, cost \$450 million. Remediation of the oxidation ponds has taken 2 ½ years and approximately 3 ½ million cubic metres of sludge was removed, dewatered and disposed of to landfill. The new plant extracts 100,000 tonnes of biosolids from sewage flows a year, which is also buried in landfills.

Environmental issues are a relatively recent concern since the advent of the Resource Management Act 1991, and social and cultural considerations even more so. This is demonstrated by the fact that historic decision-making has been based on economic cost / benefit analysis as the major decision driver. New methods such as the weighted attributes method allow due consideration of other factors. Further new models now allow the factoring in of environmental impacts in the context of the cost to avoid, remedy or mitigate the negative effects of a particular development activity. Methods that effectively and accurately incorporate the social and cultural impacts of a particular development activity have yet to be created.

A 1996 Greenpeace publication, “*Sewage Pollution in the Pacific*”, regarding appropriate technologies for the Pacific supports the findings and results from the Mauri model analysis and states that:

“Globally, sewage is a major component of marine pollution from land-based activities, which account for roughly three-fourths of all pollutants entering the world’s oceans. Land-based sources of marine pollution are contributing to an alarming decline in the health of the world’s marine ecosystems and their ability to provide for human needs. Sewage along with other forms of pollution from land-based activities is blamed for the decline and collapse of fisheries and tourism, and represents a severe threat to public health in various regions around the world.”

In particular the report is critical of conventional systems of wastewater disposal systems making the following points:

- sewage is the most significant source of marine pollution in the Pacific region.

- environmental problems have included algae blooms and eutrophication in lakes and estuaries
- health problems have included contaminated rivers and closed beaches
- habitat destruction at point discharges particularly into highly sensitive receiving waters
- approximately half of the additional nutrients flowing into oceans is the result of raw or partially treated sewage.

These widespread problems, the report states, are “testimony to the failure of the conventional approach to pollution, which attempts to manage and control it by seeking ‘proper’ disposal options. In the case of human excreta, this has primarily meant using water to carry wastes out of sight through reticulated systems. These conventional sewage treatment options may partially reduce pollution and health problems or shift them from one place to another, but they do not solve them.”

The report concludes that using water to transport human excreta leads to environmental contamination and is a waste of financial resources as well as fresh water resources. The report recommends the adoption of approaches that have been identified in scenarios given preliminary analysis in the previous section of this report.

Recent investigations into infrastructure options have identified that similar research is being conducted for Waitakere City Council, Ecowater by URS on a project named NORSGA.

Discussions with URS New Zealand Ltd (URS), formally Woodward-Clyde (NZ), have identified that there are potential synergies between the SmartGrowth project work on wastewater issues and the Ecowater project with the Waitakere City Council. URS have a current project present in the Western Bay of Plenty on the evaluation of a project work in the. URS are currently working in the subregion and have also successfully consented, designed and commissioned some internationally significant wastewater systems and have unique experience with the technology. In particular, a new method of effluent disposal using sophisticated subsurface drip irrigation (SDI) technologies that enable disposal of effluent below the surface of the ground has been developed. This has a large number of public health and environmental issues and has found favour and support with many Iwi groups.

At the time of writing this report the work currently being done on NORSGA is sensitive because of the land use changes that are currently being considered. The study covers looking at a range of

water cycle options for a 50-year development period. There are several other related technical studies also underway.

7. Conclusions and Recommendations

Our contemporary way of life tends to prioritise economic well-being ahead of the other three criteria. Recognition of the relative importance of the environment for our continued existence is improving, however the connection between activities in the environment and social and cultural well-being is still not very well understood.

This evaluation identifies the contrasting results that are likely when Tangata whenua values are used as the decision-making criteria. In particular the new challenge is to develop the decision-making model further for inclusion of Tangata whenua priorities in the 50 year SmartGrowth strategy. Tangata Whenua consider that longer timeframes for planning are necessary given traditional perspectives of consideration of the future generations in the context of the mokopuna of the mokopuna, and the lifecycles of the infrastructure being considered.

To adequately incorporate Tangata Whenua cultural values and principles in relation to wastewater infrastructure management the following actions must be addressed:

1. That the Project Management Team, Tangata Whenua and the Services Project Team incorporate the finding of this report into the final SmartGrowth Strategy;
2. That the Mauri modelling and the infrastructure scenarios identified in Section four (4) of this report be rerun through the Harrison Greirson Consultants analysis programme for the Papamoa East development;
3. That the final SmartGrowth strategy establish stretched targets that implement changes to the current management, design and timeframes for wastewater and water supply infrastructure;
4. Adopt stretched targets that define the proportion of disposal to land from current infrastructure, new development, and overall that is expected at five yearly intervals;
5. That Tangata Whenua are involved in further research into the feasibility of alternative wastewater infrastructure systems and kept informed about national projects;
6. That a Tangata Whenua pilot project on alternative wastewater treatment systems be established within the subregion as part of the SmartGrowth implementation plan.

APPENDIX 1

Excel spreadsheet detailing the Option analysis using Mauri Model

Option Analysis Using Mauri Model.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
1	Pricing	Full cost recovery water supply	1	3	3	4	3.2	80.0%	83.0%
2	Pricing	Tiered structure for water rates	3	4	2	2	2.5	62.5%	100.0%
3	Pricing	Incentives for water efficiency	4	4	4	3	3.6	90.0%	100.0%
4	Regulation	Bans on types of use	0	4	4	4	3.6	90.0%	75.0%
5	Education	Public seminars	3	4	4	4	3.9	97.5%	100.0%
6	Education	Printed material	2	3	2	2	2.2	55.0%	100.0%
7	Education	Water audits	1	4	4	3	3.3	82.5%	83.0%
8	Minimise leakage	Materials selection	3	4	0	2	1.9	47.5%	100.0%
9	Minimise leakage	Construction	2	4	1	3	2.5	62.5%	100.0%
10	Customer info	Internet information	3	2	2	2	2.1	52.5%	100.0%
11	Reduce consume	Reduce supply pressure	1	1	3	3	2.4	60.0%	83.0%
12	Reduce consume	Dual flush	2	2	3	3	2.7	67.5%	100.0%
13	Reduce consume	Water saving fixtures	1	3	3	4	3.2	80.0%	100.0%
14	Reduce consume	Washing machines	1	3	2	4	2.9	72.5%	92.0%
15	Reduce consume	Gardens	1	2	4	4	3.3	82.5%	84.0%
16	Reduce consume	Sprinklers & eliminate FH	1	3	3	4	3.2	80.0%	67.0%
17	Reduce consume	No fire	1	3	1	3	2.2	55.0%	67.0%
18	Peak levelling	Household tank	0	3	3	3	2.7	67.5%	67.0%
19	Peak levelling	Rainwater tanks	1	3	4	4	3.5	87.5%	67.0%
20	Peak levelling	Neighbourhood tank	2	4	3	3	3.1	77.5%	75.0%
21a	Greywater use	To flush toilets	3	3	1	0	1.2	30.0%	50.0%
21b	Greywater use	To garden	1	2	4	2	2.5	62.5%	50.0%
22	Greywater use	Public space irrigation	2	3	4	3	3.2	80.0%	59.0%
23	Groundwater use	Neighbourhood potable	3	3	3	4	3.4	85.0%	84.0%
24a	Groundwater use	To flush toilets	1	1	0	0	0.3	7.5%	92.0%
24b	Groundwater use	To garden	3	2	2	4	2.9	72.5%	92.0%
25	Groundwater use	Public space irrigation	2	3	2	4	3	75.0%	92.0%

Option Analysis Using Mauri Model.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
26	Rainwater use	Rainwater tanks	2	4	4	4	3.8	95.0%	67.0%
27	Rainwater use	Rainwater tanks + topup	3	4	4	4	3.9	97.5%	50.0%
28	Stormwater use	Pond to public space irrigation	3	4	4	4	3.9	97.5%	84.0%
29a	Stormwater use	Pond to flush toilets	1	2	0	0	0.5	12.5%	75.0%
29b	Stormwater use	Pond to garden	2	3	4	4	3.6	90.0%	75.0%
30	Stormwater use	Neighbourhood carwash	2	4	3	3	3.1	77.5%	75.0%
31a	Wastewater reuse	Treat onsite to flush toilets	1	3	3	0	1.6	40.0%	42.0%
31b	Wastewater reuse	Treat onsite to garden	1	2	4	4	3.3	82.5%	42.0%
32a	Wastewater reuse	Supply treated to flush toilets	2	2	2	0	1.2	30.0%	25.0%
32b	Wastewater reuse	Supply treated to garden	0	2	3	3	2.5	62.5%	25.0%
33	Wastewater reuse	Supply treated wastewater	0	1	4	0	1.4	35.0%	17.0%
34	Combined use	Onsite grey/stormwater to garden	3	4	4	4	3.9	97.5%	42.0%
35a	Combined use	Local grey/stormwater to flush	2	3	0	0	0.8	20.0%	42.0%
35b	Combined use	Local grey/stormwater to garden	3	3	4	4	3.7	92.5%	42.0%
36	Kaituna	Potable supply	1	3	3	3	2.8	70.0%	75.0%
37a	Kaituna	Flush	0	2	0	0	0.4	10.0%	75.0%
37b	Kaituna	Garden & fire	0	4	4	4	3.6	90.0%	75.0%
38	Sea water	Desalinated for potable	1	1	1	4	2.2	55.0%	59.0%
39a	Sea water	Desalinated for flush	0	1	0	0	0.2	5.0%	67.0%
39b	Sea water	Desalinated for garden	0	1	2	4	2.4	60.0%	67.0%
40	Pricing	Tiered structure for wastewater	3	2	4	3	3.1	77.5%	75.0%
41	Pricing	Trade waste agreements	4	4	4	3	3.6	90.0%	100.0%
42	Education	Public seminars	4	4	4	4	4	100.0%	100.0%
43	Education	Printed material	3	4	2	2	2.5	62.5%	100.0%
44	Reduce wet	No joints in wastewater pipes	2	4	4	4	3.8	95.0%	100.0%
45	Reduce wet	Watertight pipes	2	4	4	4	3.8	95.0%	100.0%
46	Alt. Transport	Pressurised wastewater	1	3	4	4	3.5	87.5%	67.0%
47	Alt. Transport	Vacuum sewers	1	3	4	4	3.5	87.5%	58.0%
48	Alt. Treatment	Separate scheduled flows	2	2	1	2	1.7	42.5%	75.0%

Option Analysis Using Mauri Model.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
49	Alt. Treatment	Natural treatment process	3	3	4	4	3.7	92.5%	84.0%
50	Alt. Treatment	Chemical treatment process	2	3	0	1	1.2	30.0%	67.0%
51	Alt. Treatment	UV disinfection, denitrification	1	4	4	3	3.3	82.5%	75.0%
52	Alt. Treatment	Membranes, reverse osmosis	1	4	4	3	3.3	82.5%	75.0%
53a	Alt. Treatment	Local ww treatment to land	1	3	3	3	2.8	70.0%	75.0%
53b	Alt. Treatment	Local ww treatment to water	1	3	1	0	1	25.0%	75.0%
54	Alt. Treatment	Inline treatment	2	2	1	2	1.7	42.5%	84.0%
55	Alt. Treatment	Composting blackwater	2	4	4	3	3.4	85.0%	50.0%
56	Alt. Treatment	Onsite septic and local treatment	1	2	1	2	1.6	40.0%	59.0%
57	Alt. Treatment	Sewer mining	2	2	2	2	2	50.0%	67.0%
58	Alt. Toilets	Urine separation via domestic	1	3	4	3	3.1	77.5%	50.0%
59	Alt. Toilets	Separating toilets	1	3	4	3	3.1	77.5%	50.0%
60	Alt. Toilets	Composting toilets	1	3	4	4	3.5	87.5%	58.0%
61	Flood mgmt	Detention ponds	2	3	4	4	3.6	90.0%	92.0%
62	Flood mgmt	Retention ponds	2	3	4	4	3.6	90.0%	92.0%
63	Landscape	Grass swales	3	4	4	4	3.9	97.5%	100.0%
64	Landscape	Minimise impervious surfaces	2	3	4	4	3.6	90.0%	75.0%
65	Landscape	Roof gardens	1	2	4	4	3.3	82.5%	58.0%
66	Landscape	Gardens to local soakaways	3	4	4	4	3.9	97.5%	92.0%
67	Landscape	Public areas to local soakaways	4	4	4	4	4	100.0%	100.0%
68	Landscape	Road alignment and construction	4	4	4	4	4	100.0%	100.0%
69	Landscape	Vegetation selection	3	4	4	4	3.9	97.5%	100.0%
70	Local disposal	Soakage pit every section	2	3	4	4	3.6	90.0%	100.0%
71	Local disposal	Neighbourhood soakage pits	3	2	4	3	3.1	77.5%	100.0%
72	Local disposal	Soakage trenches	2	3	4	4	3.6	90.0%	92.0%
73	Local disposal	Infiltration basins	2	3	4	3	3.2	80.0%	92.0%
74	Pricing	Impervious ratio charge	1	3	4	2	2.7	67.5%	42.0%
75	Education	Printed material	3	3	2	2	2.3	57.5%	100.0%
76	Education	Public seminars	4	4	4	4	4	100.0%	100.0%
77	Regulation	No discharge offsite	1	3	4	4	3.5	87.5%	75.0%
78	Nutrient control	Covenants on fertiliser use	2	4	4	4	3.8	95.0%	67.0%

Option Analysis Using Mauri Model.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
79	Regulation	Plumbing materials	1	3	4	2	2.7	67.5%	92.0%
80a	Nutrient control	Tertiary treat for reuse	1	4	4	4	3.7	92.5%	42.0%
80b	Nutrient control	Tertiary treat for discharge	0	1	3	1	1.5	37.5%	42.0%
81	Nutrient control	Minimise ground disturbance	1	2	4	4	3.3	82.5%	50.0%
82	Nutrient control	Use native plants	2	3	4	4	3.6	90.0%	83.0%
83	Nutrient control	Use organic composts	2	3	4	4	3.6	90.0%	92.0%
84	Improve stormwater	Neighbourhood carwash	2	3	4	3	3.2	80.0%	75.0%
85	Improve stormwater	Gross pollutant traps	2	4	4	4	3.8	95.0%	92.0%
86	Improve stormwater	Manage truck movement	2	4	4	4	3.8	95.0%	92.0%
87	Improve stormwater	Covenants on building materials	1	3	4	4	3.5	87.5%	75.0%
88	Improve stormwater	Covenant on pet ownership	1	3	4	4	3.5	87.5%	75.0%
89	Treat stormwater	Wetlands	3	4	4	4	3.9	97.5%	92.0%
90	Treat stormwater	Swales in minor stormwater	4	4	4	4	4	100.0%	100.0%
91a	Treat stormwater	Treat high std b4 land disposal	0	2	4	4	3.2	80.0%	75.0%
91b	Treat stormwater	Treat high std b4 water disposal	0	1	2	1	1.2	30.0%	75.0%
92	Pipe in & out	Reticulated water supply	4	2	3	2	2.5	62.5%	75.0%
93	Pipe in & out	Reticulated wastewater	3	2	0	0	0.7	17.5%	75.0%
94	Pipe in & out	Reticulated stormwater	4	3	1	0	1.3	32.5%	59.0%

APPENDIX 2

Spreadsheet - Short-listed options highlighting differences in The MWH results and the Mauri Model.

Short-listed Options Highlighting the Differences in the MWH and the Mauri Model Results
for Sustainable Water Management Alternatives.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
28	Stormwater use	Pond to public space irrigation	3	4	4	4	3.9	97.5%	84.0%
27	Rainwater use	Rainwater tanks + topup	3	4	4	4	3.9	97.5%	50.0%
34	Combined use	Onsite grey/storm to garden	3	4	4	4	3.9	97.5%	42.0%
26	Rainwater use	Rainwater tanks	2	4	4	4	3.8	95.0%	67.0%
35b	Combined use	Local grey/storm to garden	3	3	4	4	3.7	92.5%	42.0%
29b	Stormwater use	Pond to garden	2	3	4	4	3.6	90.0%	75.0%
37b	Kaituna	Garden & fire	0	4	4	4	3.6	90.0%	75.0%
19	Peak levelling	Rainwater tanks	1	3	4	4	3.5	87.5%	67.0%
23	Groundwater use	Neighbourhood potable	3	3	3	4	3.4	85.0%	84.0%
31b	Wastewater reuse	Treat onsite to garden	1	2	4	4	3.3	82.5%	42.0%
22	Greywater use	Public space irrigation	2	3	4	3	3.2	80.0%	59.0%
20	Peak levelling	Neighbourhood tank	2	4	3	3	3.1	77.5%	75.0%
30	Stormwater use	Neighbourhood carwash	2	4	3	3	3.1	77.5%	75.0%
25	Groundwater use	Public space irrigation	2	3	2	4	3	75.0%	92.0%
24b	Groundwater use	To garden	3	2	2	4	2.9	72.5%	92.0%
36	Kaituna	Potable supply	1	3	3	3	2.8	70.0%	75.0%
18	Peak levelling	Household tank	0	3	3	3	2.7	67.5%	67.0%
92	Pipe in & out	Reticulated water supply	4	2	3	2	2.5	62.5%	75.0%
21b	Greywater use	To garden	1	2	4	2	2.5	62.5%	50.0%
32b	Wastewater reuse	Supply treated to garden	0	2	3	3	2.5	62.5%	25.0%
39b	Sea water	Desalinated for garden	0	1	2	4	2.4	60.0%	67.0%
38	Sea water	Desalinated for potable	1	1	1	4	2.2	55.0%	59.0%
31a	Wastewater reuse	Treat onsite to flush toilets	1	3	3	0	1.6	40.0%	42.0%
32a	Wastewater reuse	Supply treated to flush toilets	0	2	2	0	1	25.0%	25.0%
33	Wastewater reuse	Supply treated wastewater	0	1	4	0	1.4	35.0%	17.0%
21a	Greywater use	To flush toilets	3	3	1	0	1.2	30.0%	50.0%
35a	Combined use	Local grey/stormwater to flush	2	3	0	0	0.8	20.0%	42.0%
29a	Stormwater use	Pond to flush toilets	1	2	0	0	0.5	12.5%	75.0%

Short-listed Options Highlighting the Differences in the MWH and the Mauri Model Results
for Sustainable Water Management Alternatives.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
37a	Kaituna	Flush toilets	0	2	0	0	0.4	10.0%	75.0%
24a	Groundwater use	To flush toilets	1	1	0	0	0.3	7.5%	92.0%
39a	Sea water	Desalinated for flush	0	1	0	0	0.2	5.0%	67.0%
49	Alt. Treatment	Natural treatment process	3	3	4	4	3.7	92.5%	84.0%
46	Alt. Transport	Pressurised wastewater	1	3	4	4	3.5	87.5%	67.0%
47	Alt. Transport	Vacuum sewers	1	3	4	4	3.5	87.5%	58.0%
60	Alt. Toilets	Composting toilets	1	3	4	4	3.5	87.5%	58.0%
55	Alt. Treatment	Composting blackwater	2	4	4	3	3.4	85.0%	50.0%
51	Alt. Treatment	UV disinfection, denitrification	1	4	4	3	3.3	82.5%	75.0%
52	Alt. Treatment	Membranes, reverse osmosis	1	4	4	3	3.3	82.5%	75.0%
58	Alt. Toilets	Urine separation via domestic	1	3	4	3	3.1	77.5%	50.0%
59	Alt. Toilets	Separating toilets	1	3	4	3	3.1	77.5%	50.0%
53a	Alt. Treatment	Local ww treatment to land	1	3	3	3	2.8	70.0%	75.0%
57	Alt. Treatment	Sewer mining	2	2	2	2	2	50.0%	67.0%
48	Alt. Treatment	Separate scheduled flows	2	2	1	2	1.7	42.5%	75.0%
56	Alt. Treatment	Onsite septic and local treatment	1	2	1	2	1.6	40.0%	59.0%
54	Alt. Treatment	Inline treatment	2	2	1	1	1.3	32.5%	84.0%
50	Alt. Treatment	Chemical treatment process	2	3	0	1	1.2	30.0%	67.0%
53b	Alt. Treatment	Local ww treatment to water	1	3	1	0	1	25.0%	75.0%
93	Pipe in & out	Reticulated wastewater	3	2	0	0	0.7	17.5%	75.0%
67	Landscape	Public areas to local soakaways	4	4	4	4	4	100.0%	100.0%
68	Landscape	Road alignment and construction	4	4	4	4	4	100.0%	100.0%
90	Treat stormwater	Swales in minor stormwater	4	4	4	4	4	100.0%	100.0%
63	Landscape	Grass swales	3	4	4	4	3.9	97.5%	100.0%

Short-listed Options Highlighting the Differences in the MWH and the Mauri Model Results
for Sustainable Water Management Alternatives.

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Option No.	Technique	Tool	Individual	Community	Environment	Haapu	Sustainability	Rating	MWH Rating
69	Landscape	Vegetation selection	3	4	4	4	3.9	97.5%	100.0%
66	Landscape	Gardens to local soakaways	3	4	4	4	3.9	97.5%	92.0%
89	Treat stormwater	Wetlands	3	4	4	4	3.9	97.5%	92.0%
85	Improve stormwater	Gross pollutant traps	2	4	4	4	3.8	95.0%	92.0%
86	Improve stormwater	Manage truck movement	2	4	4	4	3.8	95.0%	92.0%
78	Nutrient control	Covenants on fertiliser use	2	4	4	4	3.8	95.0%	67.0%
80a	Nutrient control	Tertiary treat for reuse	1	4	4	4	3.7	92.5%	42.0%
70	Local disposal	Soakage pit every section	2	3	4	4	3.6	90.0%	100.0%
61	Flood mgmt	Detention ponds	2	3	4	4	3.6	90.0%	92.0%
62	Flood mgmt	Retention ponds	2	3	4	4	3.6	90.0%	92.0%
72	Local disposal	Soakage trenches	2	3	4	4	3.6	90.0%	92.0%
83	Nutrient control	Use organic composts	2	3	4	4	3.6	90.0%	92.0%
82	Nutrient control	Use native plants	2	3	4	4	3.6	90.0%	83.0%
64	Landscape	Minimise impervious surfaces	2	3	4	4	3.6	90.0%	75.0%
87	Improve stormwater	Covenants on building materials	1	3	4	4	3.5	87.5%	75.0%
88	Improve stormwater	Covenant on pet ownership	1	3	4	4	3.5	87.5%	75.0%
65	Landscape	Roof gardens	1	2	4	4	3.3	82.5%	58.0%
81	Nutrient control	Minimise ground disturbance	1	2	4	4	3.3	82.5%	50.0%
73	Local disposal	Infiltration basins	2	3	4	3	3.2	80.0%	92.0%
84	Improve stormwater	Neighbourhood carwash	2	3	4	3	3.2	80.0%	75.0%
91a	Treat stormwater	Treat high std b4 land disposal	0	2	4	4	3.2	80.0%	75.0%
71	Local disposal	Neighbourhood soakage pits	3	2	4	3	3.1	77.5%	100.0%
80b	Nutrient control	Tertiary treat for discharge	0	1	3	1	1.5	37.5%	42.0%
94	Pipe in & out	Reticulated stormwater	4	3	1	0	1.3	32.5%	59.0%
91b	Treat stormwater	Treat high std b4 water disposal	0	1	2	1	1.2	30.0%	75.0%

APPENDIX 3

Maori expectations & their interpretation of the Treaty of Waitangi

A key source of contention over the interpretation of the Treaty has been the differences in the meaning of the English and Maori versions. The chiefs debated and signed the Treaty based on the Maori language version. It is most unlikely that the chiefs would knowingly have acted against their own interests, which they would have done in ceding sovereignty in line with the English version of Article I of the Treaty.

It is thus important for the decision makers to understand the Maori interpretation of the Treaty in order to minimise the risk of conflict arising out of poorly informed actions. The Table below encapsulates the relevant key differences in the English and Maori versions. Based on these differences, Article I authorises national government and legislation whereas Article II restrains the Crown and its agents from impinging on the chiefly authority over “forests, fisheries and treasured possessions”. Article II also provides for the agreed sale of land. Article III provides for immigration and settlement processes in exchange for Maori being granted full rights as citizens.

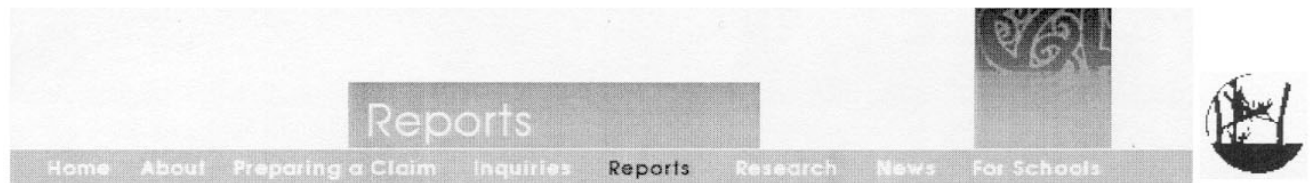
<u>Article</u>	<u>English version</u>	<u>Maori version</u>	<u>Re-translation*</u>
Article I	Chiefs cede sovereignty	nga Rangatira ... tuku kawanatanga	Chiefs permit governance
Article II	Queen guarantees full, exclusive and undisturbed possession Crown as first purchaser of freely alienated land	te Kuini ka wakarite, ka wakaae .. te tino rangatiratanga nga Rangatira tuku ki te Kuini te hokonga	The Queen acknowledges, guarantees chiefly authority ... Chiefs grant Queen the purchase of land for sale
Article III	.. Queen grants all the Rights and Privileges of British subjects	Ka tukua ... nga tikanga katoa rite tahi ki nga tangata o Ingarani	.. Queen grants all the Rights and Privileges of British subjects

* The full text of the English and Maori versions and of the translation of the Maori version into English by Sir Hugh Kawharu are available on the Waitangi Tribunal's website.

APPENDIX 4

The following are the summaries of the following Waitangi Tribunal Cases:

1. The Kaituna River Claim
2. The Mohaka River Report
3. Report on Proposed Discharge of Sewage at Welcome Bay


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The Kaituna River Claim Summary

Kaituna River Report

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Wai 4

Claim Wai 4, the Kaituna River claim, was brought on 30 January 1978 by six claimants on behalf of the Ngāti Pikiao people, a sub-tribe of Te Arawa, and concerned the Kaituna River pipeline scheme, a project developed to address pollution affecting Lake Rotorua. The main cause of the pollution was effluent from the Rotorua sewage works, so the Bay of Plenty Catchment Commission, along with the Rotorua District Council and the Ministry of Works, had gained approval to build a pipeline to take the effluent directly to the Kaituna River instead of to the lake. The Government had approved a subsidy for the scheme.

The Tribunal constituted to hear the claim comprised Chief Judge Eddie Durie (presiding), Sir Graham Latimer, and Paul Temm QC. Hearings were held in July and October 1984, and the Tribunal released its report in December 1984.

The claimants alleged that the pipeline project was contrary to the principles of the Treaty of Waitangi and asked that it be stopped because it would transfer the pollution process into their territory and was objectionable on medical, social, cultural, and spiritual grounds. The opposition of the claimants was found by the Tribunal to be deep-seated, intense, and to a degree implacable. Ngāti Pikiao elder and claimant Tamati Wharehuia urged upon the Tribunal the need to protect the Kaituna River from harm and likened the river to his own people, whom he had a duty to protect from harm. At the hearing, he demonstrated the depth of his objection to the proposed pipeline:

'If this scheme goes ahead I want to make it clear that I will myself have to take direct action. I will take the patu that has been handed down to me from my ancestors generation by generation and do injury to stop this thing. After that the law must take its course with me, but that is beside the point.'


Alec Wilson of the Arawa Trust Board came forward at the hearings to support the claimants. A member of the Ngāti Whakaue people, he said that for them Lake Rotorua no

longer provided the food that they had long been accustomed to obtain from it:

'We have to come here to ask our relatives for food. It is too late for us. The damage is done. The only fish in the lake is trout. None of the native fish is left in the Utuhina Stream nor in Lake Rotorua. ... This is our last stand.'

The Tribunal found that the scheme was contrary to the principles of the Treaty because of the pollution it would cause to the Kaituna River fisheries and that there were alternatives to the pipeline which were practical and did not go against Māori values. It recommended that the pipeline not proceed, that research be carried out into land disposal as an alternative method for getting rid of the effluent, and that the Water and Soil Conservation Act 1967 and related legislation be amended so that regional water boards and the Planning Tribunal had to take account of Māori spiritual and cultural values when they made decisions about water rights.

The Crown subsequently abandoned all financial support for the pipeline and instead announced its support for a combined treatment plant and land-disposal option for Rotorua's effluent.

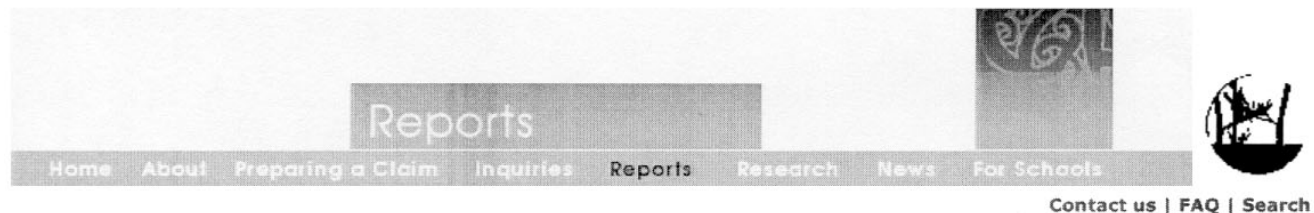
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The Mohaka River Report 1992: Summary

Wai 119

Mohaka River Report 1992

Wai 119 Summary

The Mohaka River
Report 1992

**'As old Father Thames is to the Londoner
'As the Ganges is sacred to the Indian
'As the Jordan is spiritual to the Palestines
'So is the Mohaka all these things to Ngāti
Pahauwera'**

Ramon Joe

The Mohaka River Report 1992 was the first report concerning Ngāti Kahungunu and the East Coast. It was also one of the first of the Waitangi Tribunal's 'rivers reports'. The claim concerned the tino rangatiratanga of Ngāti Pahauwera over the Mohaka River and was brought by the late Ariel Aranui, for himself and on behalf of Ngāti Pahauwera, in January 1990. The claimants said that their tino rangatiratanga over the river, as confirmed and guaranteed in article 2 of the Treaty of Waitangi, had never been relinquished.

**'The word rangatiratanga is one which Ngāti
Pahauwera favours. That is the mana, the
essential force, that they speak of in respect of
their river. That is the spirit of them all and the
power, essential force and awe. Their
rangatiratanga is the Mohaka River.'**

Charlie King

**'Rangatiratanga of a river as a "spiritual,
subsistence" and economic base can be a
tremendous heritage and resource. This would
have continued for Ngāti Pahauwera if the
Treaty and its promises had been honoured.
However ... Government neglect of Māori
Sovereignty in terms of Article 2 occurred.
'If our rangatiratanga over the river is
recognised ... we will be able to sustain our life
and begin to rebuild a corporate resource base
and offer real hope for the development of
Ngāti Pahauwera people today and for future**

generations.'

Tureiti Moxon

The river claim formed part of a wider claim relating to tribal lands in Hawke's Bay and Wairarapa. In November 1991, it was severed from that wider claim and accorded urgency by the Tribunal at the request of the claimants because the Planning Tribunal had recommended to the Minister for the Environment that a national water conservation order be placed over the river. The claimants alleged that the making of such an order without their consent would usurp their rangatiratanga and be a breach of the principles of the Treaty.

'We always talk about our river, the control of it, and its spirituality. These are the waters of sustenance. Even though administration of the river and the land has passed into Pākehā hands, we retain the control. It is in these treasures (ie the land and the river) that rests the mana. This is what we are fighting for. We know that this is where our salvation is. The control of the river has been our mana from way back. It came from our ancestors and down through the generations.'

Canon Huata

Ngāti Pahauwera's claim related to the lower reaches of the Mohaka, and they claimed that the river, including its waters, bed, and fisheries, was a taonga of theirs. In particular, they placed great emphasis on the role that the river played in their tribal identity.

'The river is a taonga that we as kaitiaki know we have to preserve. Our ancestors taught us to respect the river and if we respected the river, the river looked after us. If the river is desecrated, it will affect the very deep beliefs we have about the river. That is our Taniwha, the life force of the river, our respect for the river.'

Derek Huata

**'Ngāti Pahauwera is at the beginning of the river, at the river mouth here and out to sea. To us, those who stand on the marae, that is the spirit which is upon us. Our sacred mountain, the river of Mohaka, Ngāti Pahauwera are the people.
'The spirituality of the river, the mana, the**

sacredness and the authority relates to Ngāti Pahauwera solely. The life of the river we do not want interfered with, lest it be lost. It must be left to flow onward, in the way that it did in the days of the elders. If they were here they would be at the river as it flows onward.'

Charlie King

The Mohaka River Tribunal comprised Bill Wilson (presiding), Bishop Manuhuia Bennett, Mary Boyd, Dr Ngapare Hopa, and Georgina Te Heuheu, and hearings were held in Wellington, Mohaka, and Napier between April and June of 1992. There, the claimants argued that the Crown, through legislation (in particular, the Water and Soil Conservation Act 1967), had failed to recognise and give effect to their rangatiratanga over the Mohaka River. They claimed that this legislation was inconsistent with the principles of the Treaty because it failed to recognise tribal authority and to provide appropriate mechanisms for its exercise. The claimants sought a finding that the relevant statutes failed to provide for rangatiratanga, in breach of the Crown's Treaty obligations, and that new forms of authority for regulating the use of waters and other natural resources should be devised.


The Tribunal released its report in November 1992. In it, the Tribunal found that the Crown's obligation to protect Māori property to the fullest extent reasonably practicable was crucial to the claim and that, far from doing this, the Crown had actively undermined that interest by promoting legislation and adopting practices which had given little or no recognition to the position of Ngāti Pahauwera. The Tribunal reached the conclusion that the Mohaka River was a taonga of Ngāti Pahauwera when the Treaty was signed and still remained so. Ngāti Pahauwera did not relinquish te tino rangatiratanga over the river, or transfer ownership of its bed or waters. All statutory provisions which assumed that the Crown owned the riverbed and waters, or which conferred exclusive control over the waters on central or local government, were in breach of the Treaty.

'We urge Ngāti Pahauwera and the Crown, as Treaty partners, to enter negotiations as soon as possible as to our recommendations. We are confident that the outcome of such discussions will be an agreement which recognises the legitimate interests in the river of both Ngāti Pahauwera and the other citizens of this country and which demonstrates the Treaty of Waitangi can be made to work in a sensible and realistic way in its application to a beautiful river which is both an undoubted taonga of Ngāti Pahauwera and a great asset to the country as a whole.'

The Waitangi Tribunal

In reaching its findings, the Tribunal had traversed the issue of the *ad medium filum aquae* rule, a common-law presumption that would also be argued in other river claims. *Ad medium filum aquae* holds that the ownership of land adjoining a non-tidal river also includes the ownership of the bed of the river to its mid-point. Thus, if the bank of the river is sold, that portion of the riverbed is also sold. The Tribunal distinguished the present claim from the 1962 Court of Appeal decision in *Re: the Bed of the Whanganui River*, and found that the presumption did not apply in this case because the parties to the sale deed would not have intended that the purchase of the land would carry with it the ownership of the adjacent half of the Mohaka riverbed:

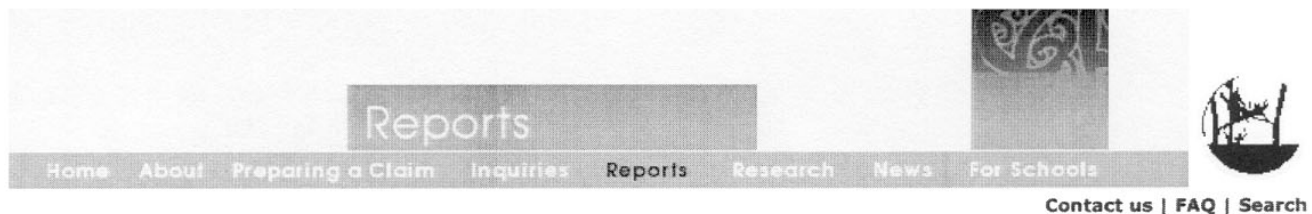
'In any event the Crown was not entitled to rely on the *ad medium filum aquae* rule, an English common law presumption which would have been known to few if any settlers in this country in 1851. To rely on such an esoteric rule to acquire a taonga of Ngāti Pahauwera without their knowledge would we think have been clearly unjust and in breach of article 2 of the Treaty.'

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Report on Proposed Discharge of Sewage at Welcome Bay

Wai 3

In 1977, the Housing Corporation at Tauranga proposed to discharge sewage collected from 15 State houses into Welcome Bay. A claim was received in June 1977 from the Tauranga executive of Māori committees asserting that Rangataua (Welcome Bay) had traditionally been an important place for local Māori and that shellfish which they habitually collected in the area would be adversely affected by the proposed discharge.

The claimants' counsel withdrew the claim in August and letters subsequently received by the Tribunal from the Housing Corporation showed that the corporation had abandoned the sewage discharge plan and the water right obtained for it. Therefore, the Tribunal reported on 20 February 1990 that it would not be inquiring further into the claim. The report was signed by Deputy Chief Judge Ashley McHugh.

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