greater WELLINGTON
REGIONAL COUNCIL

Attachment to Report 05.93

Assessment of resource consent applications for the continued operation of the Moroa and Longwood water races

WAR 010200 – South Wairarapa District Council (Moroa water race)

WAR 010201 – South Wairarapa District Council (Longwood water race)

Stephen Thawley
Senior Resource Advisor
March 2005

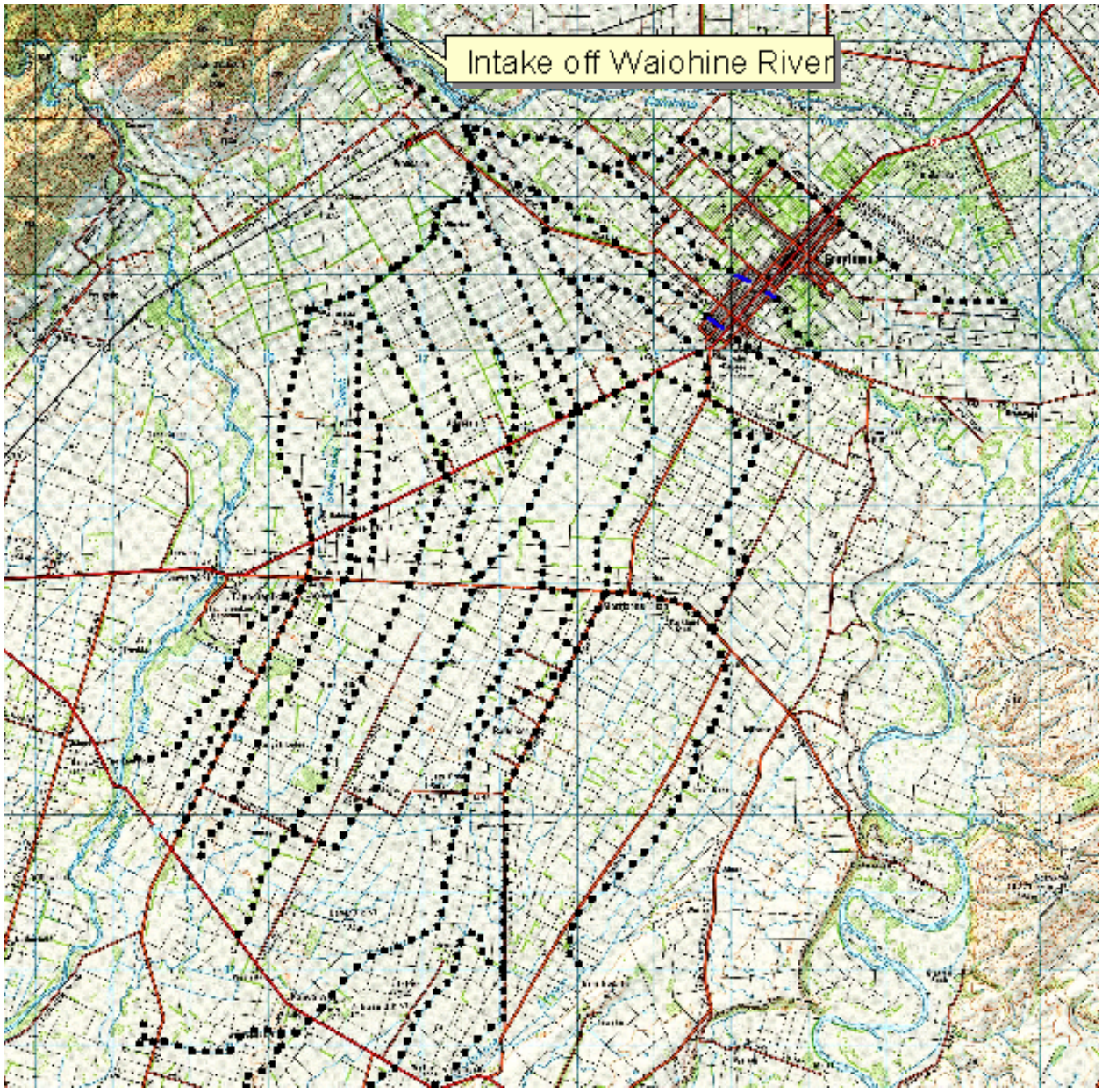
1.0 Background - Description of Activity

The South Wairarapa District Council (SWDC) has applied for a number of resource consents for the continued operation of the Moroa and Longwood water races.

1.1 Moroa Water Race

The Moroa water race was constructed in the 1890's and currently extends over 240 km in length and services approximately 8,500 ha of land and is funded by 185 ratepayers. The Moroa water race is required to provide domestic and stock water needs to properties on the Moroa plains. A schematic diagram of the approximate location of the Moroa water race is shown in Figure 1.

Figure 1: Schematic Diagram of the Moroa water race



Water is taken from the Waiohine River (through a steel grate) and fed into a diversion channel for approximately 600 metres. Water is taken from the diversion channel for the Greytown-Featherston public water supply which is authorised by a separate consent WAR 990142. This is shown in Figure 2 below:

Figure 2: Moroa Water Race

Downstream of the intake for the public water supply, the flow in the channel is regulated by an intake control structure which diverts excess water back to the Waiohine River. Downstream of the intake control structure, the water race flows in a single channel for approximately 1500 metres before it commences branching into 13 main branches across the Moroa plains surrounding Greytown. The water race terminates at 14 main locations into various watercourses including (but not limited to) Dock Creek, Otakura Stream, Tauherenikau River, and the Papawai Stream.

Periodic maintenance in required in the bed of the Waiohine River to clear gravel and debris from the steel grate. During times of low flow in the Waiohine River an extended channel and weir is required to be maintained in the river bed to enable sufficient water to be supplied to the diversion channel.

SWDC propose to take up to 500 litres/sec from the Waiohine River to operate the Moroa water race. When the flow in the Waiohine River falls below its supplementary allocation flow level a progressive stepdown allocation regime is proposed to be implemented as follows:

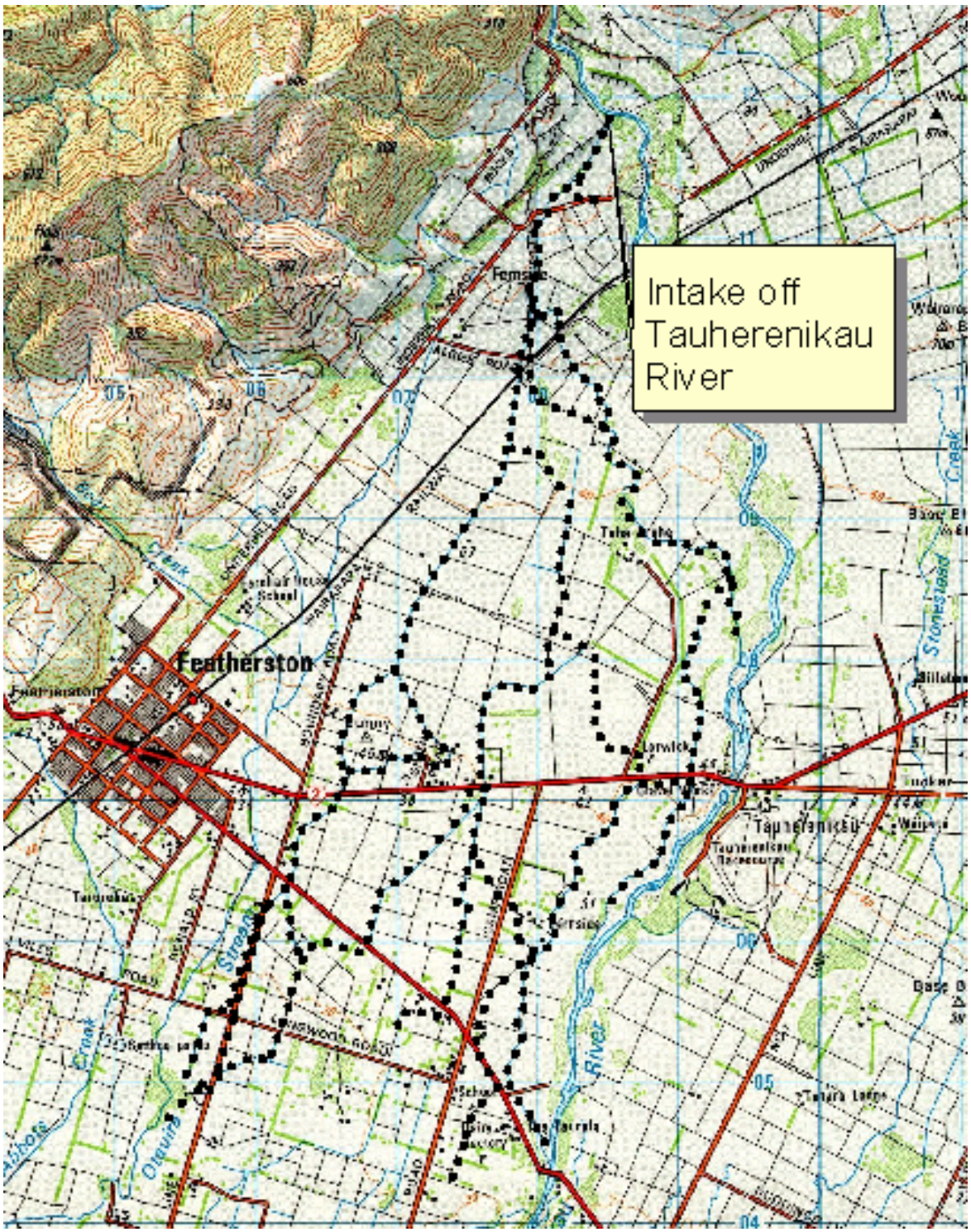
Proposed Take	**Waiohine River @ Gorge**
350 litres/sec	Below 2300 litres/sec
400 litres/sec	2300 l/sec – 3040 litres/sec
450 litres/sec	3040 l/sec – 4000 litres/sec
500 litres/sec	Above 4000 litres/sec

1.2 Longwood Water Race

The Longwood water race was constructed in the 1920's and supplies domestic and stock water to 1500 ha of land surrounding Featherston. It has a total length of 31 km and serves 56

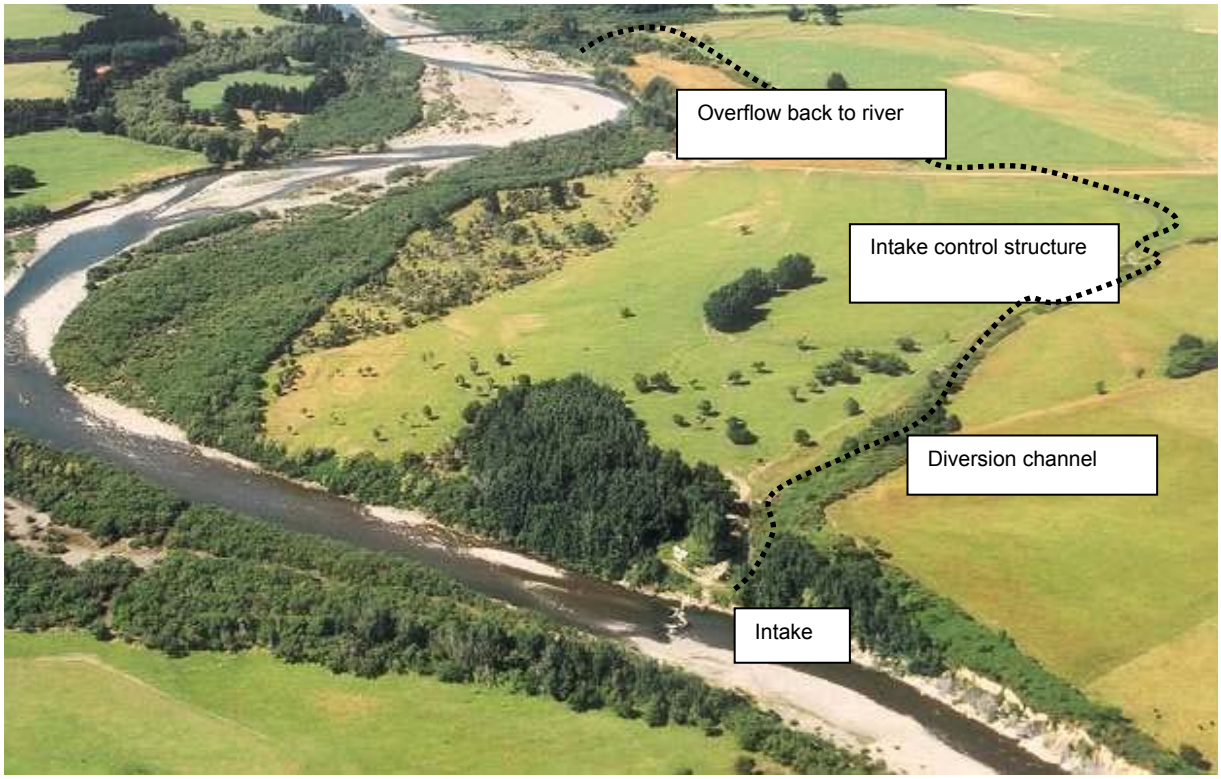
properties. A schematic diagram of the approximate location of the Moroa water race is shown in Figure 3 on the following page.

Figure 3: Schematic Diagram of the Longwood water race



Water is taken from the Tauherenikau River and fed into a diversion channel for approximately 500 metres. An intake control structure at this point regulates the amount of water which flows down the Longwood water race and excess water is diverted back to the Tauherenikau River. This is shown in Figure 4 below:

Figure 4: Longwood Water race



The water race consists of 4 main branches and terminates at 7 locations into various watercourses including (but not limited to) the Tauherenikau River and Otauira Stream.

Historically there have been problems maintaining the intake in the Tauherenikau River due to degradation of the river bed. Major reconstruction was most recently undertaken in 1999 following a flood which caused major damage to the intake. A concrete block weir extends across the channel of the Tauherenikau River in order to maintain an appropriate head of water to be diverted into the water race. Periodic maintenance is required in the bed of the Tauherenikau River to clear gravel and debris from the river intake.

SWDC propose to take up to 250 litres/sec from the Tauherenikau River to operate the Longwood water race. When the flow in the Waiohine River falls below its supplementary allocation flow level a progressive stepdown allocation regime is proposed to be implemented as follows:

Proposed Take	**Tauehereniakau River @ Gorge**
100 litres/sec	Below 1100 litres/sec
100 litres/sec	1100 l/sec – 1350 litres/sec
180 litres/sec	1350 l/sec – 2000 litres/sec
250 litres/sec	Above 2000 litres/sec

2.0 Statutory Reasons for Consent Requirements

Sections 13-15 of the Resource Management Act 1991 (RMA) states the restrictions in river and lake beds, restrictions relating to water, and discharges of contaminants in to the environment. A copy of these sections of the RMA is available on request.

2.1 Longwood Water Race

Prior to the enactment of the RMA, water takes were controlled by the Water and Soil Conservation Act 1967 (WSCA). When the WSCA was enacted in 1967, all existing uses of water were required to be notified to the Wairarapa Catchment Board before 1st April 1969. The Featherston County Council submitted their notification prior to that date (on 31st March 1969) and they were permitted to operate the Longwood water race under the WSCA with this `notified use right'. The notified use right for the Longwood water race (WAR 690425) was for the taking of water from the Tauherenikau at a maximum rate of 15 cusecs (425 litres/sec).

The Water Resources Management Plan for the Tauherenikau Water Resource Region (1984) noted that the notified use right for 425 litres/sec was excessive and for the purpose of the water allocation plan outlined an average abstraction rate of 200 litres/sec. Although no formal records have been located, it is understood that the SWDC or its predecessor partially surrendered the abstraction rate in the notified use right to 200 litres/sec, to allow for reduced resource management charges when they were implemented in the 1980's.

The WSCA was repealed by the RMA on 1st October 1991. Under section 386 of the RMA all notified use rights under the WSCA were deemed to expire on the tenth anniversary of the enactment of the RMA, in this case the 1st October 2001. Hence the SWDC submitted resource consent applications in 2001 to authorise activities that require resource consents under sections 13-15 of the RMA.

2.2 Moroa Water Race

Through assessment of the resource consent application, an old notified use right was discovered for the Moroa water race. Notification of this existing use right was provided by the Featherston County Council on 31st March 1969, however it has not been established whether this was formally accepted by the consenting authority at that time. The notification stated that 40 cusecs (1135 litres/sec) was taken from the Waiohine River for the purpose of supplying domestic and stock water and irrigation of orchards, small fruits, and market gardens. However it has not been established whether this notification was officially received and accepted by the Wairarapa Catchment Board.

Nevertheless since 1980, the taking of water from the Waiohine River for the Moroa water race has operated legally under water rights (WAR 800041 & WAR 850108) issued under the WSCA and a water permit (WAR930125) issued under the RMA.

Water right WAR 800041 authorised the taking of up to 26 cusecs (740 litres/sec) from the Waiohine River. This water right expired in September 1985. Water right WAR 820108 authorised the taking of up to 740 litres/sec from the Waiohine River until 30th September 1990. This water right identified three irrigation takes from the Moroa water race in the Greytown area.

Following the expiry of water right WAR 850108, a renewal application for the Moroa water race was not lodged until 1993. The application was placed on hold for a significant period of time as an `Assessment of Environmental Effects' (AEE) report was requested. After extensive discussions over a number of years, a short term consent was issued in 2000 which expired on 1st October 2001 at the same time as all other water races in the Wairarapa.

The SWDC then submitted resource consent applications for the continued operation of the Moroa water race in 2001.

2.3 Activities that Require Resource Consent

Greater Wellington has prepared the Regional Freshwater Plan for the Wellington Region (Regional Freshwater Plan or RFP) which became operative in 1999. The RFP specifies a number of rules in relation to activities specified in sections 13-15 of the RMA. In summary the resource consent applications made and the relevant rules as to why resource consents are required, is detailed in Tables 1 & 2 below:

Table 1: Resource Consent Applications – Moroa Water Race

Application	Activity	Activity Status
WAR 010200 (21378)	Water permit to take and use surface water from the Waiohine River (via the diversion channel) at a maximum rate of **500 litres/sec**	Section 14 RMA Rule 16 RFP – discretionary activity
WAR 010200 (21379)	Water permit to divert up to **1000 litres/sec** from the Waiohine River to the intake control structure, and back to the Waiohine River via an overflow channel	Section 14 RMA Rule 16 RFP– discretionary activity
WAR 010200 (21586)	Discharge permit to discharge any water which may contain contaminants to various watercourses	Section 15 RMA Rule 5 RFP– discretionary activity
WAR 010200 (21587)	Land use consent for works in or on the bed of the Waiohine River	Section 13 RMA Rule 49 RFP– discretionary activity

Table 2: Resource Consent Applications – Longwood Water Race

Application	Activity	Activity Status
WAR 010201 (21377)	Water permit to take and use surface water from the Tauherenikau River at a maximum rate of **250 litres/sec**	Section 14 RMA Rule 16 RFP – discretionary activity
WAR 010201 (21593)	Water permit to divert up to **450 litres/sec** from the Tauherenikau River to the intake control structure, and back to the Tauherenikau River via an overflow channel	Section 14 RMA Rule 16 RFP– discretionary activity
WAR 010201 (21594)	Discharge permit to discharge any water which may contain contaminants to various watercourses	Section 15 RMA Rule 5 RFP– discretionary activity
WAR 010201 (21595)	Land use consent for works in or on the bed of the Tauherenikau River	Section 13 RMA Rule 49 RFP– discretionary activity

The applicant seeks a consent term of 20 years for all the applications made.

3.0 Resource Consent Process

3.1 Notification

The resource consent applications were officially received by Greater Wellington on 29th June 2001. The applications were placed on hold under section 92 of the RMA and further information was requested. Although an `Assessment of Environmental Effects' (AEE) report was not submitted with the resource consent applications on this date, a basic draft AEE report was supplied on 26th July 2001. A more complete draft AEE report was submitted on 13th September 2001. There were significant delays in the provision of further information which finally arrived in June 2003.

Following the receipt of further information in June 2003, the applications were notified under Section 93 of the RMA on 25th June 2003. Two signs were placed at the closest public access to the intakes for both water races. An advertisement appeared in the Wairarapa Times-Age and Wairarapa News on 25th June 2003. The following parties were individually notified in writing:

- Department of Conservation
- Wellington Conservation Board
- Royal Forest & Bird Protection Society
- Wellington Fish & Game Council
- Rangitaane o Wairarapa
- Ngati Kahungunu ki Wairarapa
- Te Puni Kokiri
- Ministry for the Environment
- Choice Health
- Opus International Consultants Ltd
- Federated Farmers of NZ (Inc)
- Greenpeace NZ
- Wairarapa Outdoor Pursuits
- Landowners adjacent to both water races
- Consent holders who take water from watercourses affected by both water races

The notification period for lodging submissions closed on 23rd July 2003.

3.2 Submissions – Moroa Water Race

25 formal submissions were received on the Moroa water race applications. 19 submissions supported the applications, 4 submissions opposed the application, and 2 submissions neither supported or opposed the applications. Letters were received from Ngati Kahungunu ki Wairarapa and SWDC Maori Standing Committee. Both letters expressed support to the water races, however they were not received in the form of a formal submission. More comments about these letters are provided in section 5.6 of this report.

A brief summary of the submissions is summarised in Table 3 below:

Table 3: Summary of Submissions – Moroa Water Race

Submitter Name	Support/ Oppose	Summary of Submission
B Kempton	Support	• Moroa water race supports significant area of farming land, and over a period of 100+ years it had become part of the rural landscape providing stock water, wildlife habitat, and stormwater disposal. • Surveys show that over 90% of users could not provided any other form of stock water. • Fully supports applications made by SWDC.
I A & R E Montgomerie	Support	• Moroa water race is vital for stock farming given that groundwater is unreliable. The water race also supports wildlife habitat and provides a water supply for fire fighting. • Fully supports applications made by SWDC as there are no other alternatives.
S & S Barton	Support	• Supports applications as alternative water supplies would require wells and electricity and the water race is historical and has its own ecosystem. • Supports Code of Practice which the Moroa water race committee encourages.
J L Willis	Support	• Supports applications as stock water is required for farming. • Requests Greater Wellington to grant application with same conditions as present, for 20 years.
M F Gibson	Support	• Supports applications as Moroa water race is integral part of viability of land for grazing purposes.
P Lovett	Support	• Supports applications as alternative water supplies (i.e. bores) are very costly and there is no guarantee of finding alternative supplies.

		• Requests Greater Wellington to grant applications to allow for continued flow of stock water.
M Lovett	Support	• Supports applications as water is critical for Moroa district and supplies main source of water to several hundred acres. Without this water there would be a serious financial burden. • Requests Greater Wellington to grant applications to allow for continued flow of stock water.
R J Tosswill	Support	• Supports applications as no reliable natural or underground water source for stock water consumption is available on the property of 432 ha.
R A Wilkie	Support	• Supports applications as water race is a vital part of farming operation of 140 ha. Any alternative supply would be a huge cost.
P J & J M Brooker	Support	• Supports applications as 484 ha farm is totally reliant on water race. Annual cleaning and maintenance of the property keeps the race running properly.
D Q Raymond & T M Donald	Support	• Supports applications as no reliable natural or underground water source for stock water consumption is available on the property.
D B Osborne Trust	Not specified	• Wishes the present situation with the Moroa water race to remain.
N J & R A Svenson	Support	• Supports applications as groundwater source on property is high in manganese content, hence any filtration of groundwater for stock water purposes would be too expensive.
R Schofield & M MacGillivray	Oppose	• Opposes applications as water race has is not used on 10 ha property (planted in olives and hazelnuts) and has no benefit. • Water race has following drawbacks: landowners who do not use the race are subsiding the scheme for others, additional expense and time is required for cleaning, presence is using up productive horticultural land, and its presence poses significant water hazards especially to children. • Would like to see SWDC mitigate issues identified by not charging rates for landowners who do not use race, divert water around property, allow for landowners to “opt out” of water race. • Would like to see a maximum of 10 years if consent is granted, due to changing land use.
B K Houghton	Support	• Supports applications as water is used to feed stock troughs on property.
Rangitaane o Wairarapa Inc	Oppose	• RoW make submission as part of their kaitiaki responsibilities which include the health of Papatuanuku, in which rivers are the blood vein of Papatuanuku. • Have issues with diversions and mixing of water from one river to another. • Concerned about additional pressures the water race has on the Waiohine River particularly during low flows and would like to size a reduced take during such times. • Would like to see a plan in place that works towards more efficient use of the water, as the water race at present is inefficient with losses to groundwater and evaporation. • Concerned about the water quality in the water race and its associated impacts on receiving waters. Would like to see investigations into pollution sources and steps put in place to mitigate them (e.g. fencing water race). • Would like to see a 10-15 year consent term.
Wellington Fish & Game Council	Oppose	• Waiohine River provides important trout habitat and recreational value (supported by the RFP) and is considered a regionally significant resource in terms of angling numbers. • The take has potential to adversely effect trout habitat and angling values particularly during low flow periods, although supports the reduction in take during such times. • Concerned that AEE does not consider effect of take on downstream water quality in the Waiohine River. • Concerned that only 20% of water taken is returned back to natural

		watercourses and the associated discharge is in a degraded state from when it was taken. On this basis, the design of the water race is outdated. • Concerned that the diversion of water from the Waiohine River to the start of the water race may be up to 45% of the entire flow of the river. Questions the classification and management of this section of intake channel including its ability to sustain fish passage. • The efficiency of the Moroa water race is not defined. • Believes that internal farm systems may be able to deliver stock water with low costs and therefore the economic value of water could be greater if used for other projects. • Although improvements in the water quality of the race are identified (e.g. fencing race with a hotwire), this would not address problems of bank degradation and filtering run-off through growth of sward of grass. • Asks a number of questions about rating/maintenance of the water race, including who pays in what circumstances. Would like to see the Code of Practice developed to be mandatory rather than voluntary, in order to give the Council the ability to prosecute users who do not maintain the race in a clean state. • Asks a number of questions about disturbance of the river bed at the intake, including the timing, frequency, and nature of maintenance undertaken in the Waiohine River. Would like any river bed disturbance to be kept to a minimum and outside of the trout spawning period between 1st May and 30th September. • Asks a number of questions about the monitoring of both water quality and quantity in the water race, particularly the frequency and location of monitoring, parameters to be monitored, and monitoring of activities causing water quality degradation within the race. Would like to see water quality parameters, location, and frequency of sampling to be expanded. • Would like to see a consent term of no more than 10 years (with review clause linked to RFP changes), in lieu of an alternative supply being developed after that date, with investigations into a piped stock water scheme.
Wellington Conservation Board	Oppose	• Believes that water race is inefficient use of water and would like to see measures put in place to ensure that water is used more efficiently over time. • Concerned about water take during low flow periods and would like to see a reduced take during such times. • Concerned about the quality of water in the water race and the impact of discharges back to natural watercourses and would like to see measures put in place to ensure that the water quality is improved (e.g. though fencing off races).
A Cox	Support	• Supports applications and requests that the water race remain as is.
C Mensen	Support	• Supports applications as water race is only cost effective and economic way of distributing stock water to 80 ha property and alternatives are not practicable, whilst its supports its own ecosystem with native and introduced species.
S Hammond	Support	• Supports applications as the water race has an economic benefit to the community and provides stock water to many areas that do not have access to groundwater.
A D Harvey	Support	• Supports applications as water race is vital for irrigation, stock water, and fire fighting.
R H G Calvert	Support	• Supports applications as water race is vital for providing stock water, particularly during dry summer months.
Choice Health	Neither support nor oppose	• Would like to see a consent condition that seeks to reduce in contamination of the water race as a result of farming activity. • Would like to see a consent condition that seeks to remind landowners/users that water is unsuitable for human consumption without prior treatment.
Department of	Support	• An equilibrium has been established between river, streams and

Conservation		groundwater in the area due to the long period of time that the races have been operating for. • Aquatic habitats have been created in the water race hence any alternative options such as piping of the water race will results in the destruction of such habitats. • Would like to see the rate of take reduced as the flow in the Waiohine River falls. • Would like to see the Code of Practice promoted by the applicant. • Would like to see any eels and fish returned to any race or watercourses following cleaning, possibly through amending the Code of Practice. • Would like to see the consent term limited to a period of 10 years.

3.2 Submissions – Longwood Water Race

9 formal submissions were received on the Longwood water race applications. 5 submissions supported the applications, 3 submissions opposed the application, and 1 submission neither supported or opposed the applications. Letters were received from Ngati Kahungunu ki Wairarapa and SWDC Maori Standing Committee. Both letters expressed support to the water races, however they were not received in the form of a formal submission. More comments about these letters are provided in section 5.6 of this report. A brief summary of the submissions is summarised in Table 4 below.

Table 4: Summary of Submissions – Longwood Water Race

Submitter Name	Support/ Oppose	Summary of Submission
P Smith	Support	• Supports applications as water race is essential to farming operation for stock water supply for over 33 ha.
S & S Barton	Support	• Supports applications as alternative water supplies would require wells and electricity, the water race is historical and has its own ecosystem, and land value may decline.
M Lovett	Support	• Supports applications as water is critical for Tauherenikau district and supplies main source of water to several hundred acres. Without this water there would be a serious financial burden.
P Lovett	Support	• Supports applications as alternative water supplies (i.e. bores) are very costly and there is no guarantee of finding alternative supplies.
Rangitaane o Wairarapa Inc	Oppose	• RoW make submission as part of their kaitiaki responsibilities which include the health of Papatuanuku, in which rivers are the blood vein of Papatuanuku. • Have issues with diversions and mixing of water from one river to another. • Concerned about additional pressures the water race has on the Tauherenikau River particularly during low flows and would like to size a reduced take during such times. • Would like to see a plan in place that works towards more efficient use of the water, as the water race at present is inefficient with losses to groundwater and evaporation. • Concerned about the water quality in the water race and its associated impacts on receiving waters. Would like to see investigations into pollution sources and steps put in place to mitigate them (e.g. fencing water race). • Would like to see a 10-15 year consent term.
Wellington Fish & Game Council	Oppose	• Tauherenikau River provides important trout habitat (supported by the RFP) and recreational value and is considered a locally significant resource in terms of angling numbers. • The take has potential to adversely effect trout habitat and angling values particularly during low flow periods, although supports the reduction in take during such times.

		• Concerned that AEE does not consider effect of take on downstream water quality in the Tauherenikau River. • Concerned that only 20% of water taken is returned back to natural watercourses and the associated discharge is in a degraded state from when it was taken. On this basis, the design of the water race is outdated. • Concerned that the diversion of water from the Tauherenikau River to the start of the water race may be up to 45% of the entire flow of the river. Questions the classification and management of this section of intake channel including its ability to sustain fish passage. • The efficiency of the Longwood water race is not defined. • Believes that internal farm systems may be able to deliver stock water with low costs and therefore the economic value of water could be greater if used for other projects. • Although improvements in the water quality of the race are identified (e.g. fencing race with a hotwire), this would not address problems of bank degradation and filtering run-off through growth of sward of grass. • Asks a number of questions about rating/maintenance of the water race, including who pays in what circumstances. Would like to see the Code of Practice developed to be mandatory rather than voluntary, in order to give the Council the ability to prosecute users who do not maintain the race in a clean state. • Asks a number of questions about disturbance of the river bed at the intake, including the timing, frequency, and nature of maintenance undertaken in the Tauherenikau River. Would like any river bed disturbance to be kept to a minimum and outside of the trout spawning period between 1st May and 30th September. • Asks a number of questions about the monitoring of both water quality and quantity in the water race, particularly the frequency and location of monitoring, parameters to be monitored, and monitoring of activities causing water quality degradation within the race. Would like to see water quality parameters, location, and frequency of sampling to be expanded. • Would like to see a consent term of no more than 10 years (with review clause linked to RFP changes), in lieu of an alternative supply being developed after that date, with investigations into a piped stock water scheme.
Wellington Conservation Board	Oppose	• Believes that water race is inefficient use of water and would like to see measures put in place to ensure that water is used more efficiently over time. • Concerned about water take during low flow periods and would like to see a reduced take during such times. • Concerned about the quality of water in the water race and the impact of discharges back to natural watercourses and would like to see measures put in place to ensure that the water quality is improved (e.g. though fencing off races).
Choice Health	Neither support nor oppose	• Would like to see a consent condition that seeks to reduce in contamination of the water race as a result of farming activity. • Would like to see a consent condition that seeks to remind landowners/users that water is unsuitable for human consumption without prior treatment.
Department of Conservation	Support	• An equilibrium has been established between river, streams and groundwater in the area due to the long period of time that the races have been operating for. • Aquatic habitats have been created in the water race hence any alternative options such as piping of the water race will results in the destruction of such habitats. • Would like to see the rate of take reduced as the flow in the Tauherenikau River falls. • Would like to see the Code of Practice promoted by the applicant. • Would like to see any eels and fish returned to any race or watercourses following cleaning, possibly through amending the Code of Practice.

		• Would like to see the consent term limited to a period of 10 years.

3.3 Pre-Hearing Meeting

Following the close of submissions, a pre-hearing meeting was held on Tuesday 5th August 2003 to discuss issues raised in the submissions. The key outcomes of the meeting were that the applicant would review the Code of Practice and assessment of alternative options provided in the AEE report. This information was provided on 16th September 2003.

3.4 Resolutions of Submissions

Following the provision of further information in September 2003, Greater Wellington assessed the resource consent applications and provided a draft recommendation to grant the resource consents subject to a number of proposed consent conditions. The assessment and proposed consent conditions were sent to the applicant for comment. Following a number of months of discussions and minor changes both Greater Wellington and South Wairarapa District Council agreed on the proposed consent conditions.

At this point a summary of the assessment and the proposed consent conditions were sent to all submitters and those who requested to heard at a hearing were asked to provide written approval to the proposed consent conditions. All submitters who requested to be heard at a hearing have provided written approval to the proposed consent conditions, and a number of other submitters who did not request to be heard. Hence as all relevant parties have agreed to the draft recommendation a formal hearing is not required. A copy of all written approvals provided is available on request.

4.0 Matters to be Considered

4.1 Decisions on Resource Consent Applications (Sections 104-108 of Resource Management Act 1991)

Section 104 of the RMA outlines the matters that a consent authority is to have regard to when considering any resource consent applications and any submissions received. This section is subject to Part II (sections 5-8) of the RMA – the purpose and principles. A summary of Part II is outlined below:

Section 5 of the RMA sets out the purpose of the Act, which is to promote the sustainable management of natural and physical resources. Section 5 defines sustainable management as:

> "managing the use development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well being and for their health and safety while:
>
> (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
> (b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
> (c) Avoiding, remedying or mitigating any adverse effects of activities on the environment."

Section 6 concerns matters of national importance, specifically:

- Preservation of the natural character of wetlands, rivers and their margins;
- Protection of outstanding natural features and landscapes;
- Protection of areas of significant indigenous vegetation and fauna;
- Maintenance and enhancement of public access to rivers; and

- The relationship of Maori and their culture and traditions with ancestral lands, water, sites, waahi tapu and other taonga.

Section 7 addresses other matters, such as kaitiakitanga, efficient use and development of natural and physical resources and their finite characteristics, amenity values and ecosystems, heritage values, quality of the environment, and the habitat of trout and salmon.

Section 8 requires that the principles of the Treaty of Waitangi be taken into account. There is no land associated with the application that is in Maori ownership or of particular interest to Maori. The Treaty is addressed in general terms by ensuring that the effects of the proposal are adequately assessed and conditions set to provide protection of the environment.

Under **section 104**, the relevant matters in considering these applications are:

- Any actual and potential effects on the environment of allowing the activity; *(An assessment of the actual and potential effects is provided in section 5 of this report.)*
- Any relevant regulations;
- Any relevant regional policy statement; *(The Regional Policy Statement for the Wellington Region is discussed in section 4.2 of this report.)*
- Any relevant objectives, policies, rules or other provisions of a plan or proposed plan; *(The Regional Freshwater Plan for the Wellington Region is discussed in section 4.3 of this report.)*
- Any relevant district plan or proposed district plan, where the application is made in accordance with a regional plan; *(There are no matters in South Wairarapa District Plan that are not covered under the RPS or RFP.)*
- Any other matters the consent authority considers relevant and reasonably necessary to determine the application.

Under **Section 104 B** of the RMA, the consent authority may grant or refuse a consent application for a discretionary activity and (if granted) may impose conditions under Section 108 of the RMA. In this case all the resource consent applications made are discretionary activities as discussed in section 2 of this report.

Section 105(1) of the RMA states that where an application is for a discharge permit, the consent authority shall have regard to the following when considering the actual or potential effects of the activity on the environment:

- The nature of the discharge and sensitivity of the receiving environment, and the applicant's reasons for making the proposed choice.
- Any possible alternative methods of discharge including discharge into any other receiving environment.

Furthermore, **Section 104(3)(c)** of the RMA states that a consent authority shall not grant a discharge permit to water if it is contrary to provisions in **section 107** of the RMA. These provisions state that a discharge permit shall not be granted if after reasonable mixing any contaminants are likely to give rise to the any of the following effects:

- The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:
- Any conspicuous change in the colour or visual clarity:
- Any emission of objectionable odour:
- The rendering of fresh water unsuitable for consumption by farm animals:

- Any significant adverse effects on aquatic life.

Sections 105(1), 104(3)(c), and 107 are discussed further in section 5.3 of this report.

4.2 Relevant Provisions of the Regional Policy Statement for the Wellington Region

I have assessed the Regional Policy Statement (RPS) and believe that all three objectives and eight policies below are relevant in assessing and considering the applications made.

The three objectives relating to freshwater in the RPS are:

- The *quantity* of fresh water meets the range of uses and values for which it is required, safeguards its life supporting capacity, and has the potential to meet the reasonably foreseeable needs of future generations;
- The *quality* of fresh water meets the range of uses and values for which it is required, safeguards its life supporting capacity, and has the potential to meet the reasonably foreseeable needs of future generations; and
- Freshwater resources of significance or of high value for cultural, spiritual, scenic, ecosystem, natural, recreational, or other amenity reasons are protected or enhanced.

The RPS has sixteen policies in relation to fresh water. The relevant policies or parts of policies that need to be taken into consideration when assessing these applications are:

- Policy 1 – To manage fresh water quantity for a wide range of uses and values, while safeguarding its life supporting capacity, sustaining its ability to meet the reasonably foreseeable needs of future generations, and avoiding, remedying or mitigating any adverse effects on aquatic ecosystems.
- Policy 2 – To promote the conservation and efficient use of freshwater.
- Policy 4 – To maintain and protect quality of fresh water so that it is available for a wide range of uses and values, while safeguarding its life supporting capacity, sustaining its ability to meet the reasonably foreseeable needs of future generations, and avoiding, remedying or mitigating any adverse effects on aquatic ecosystems.
- Policy 5 – To improve water quality so that it is appropriate for its desired uses and natural values.
- Policy 6 – To ensure that effects of contaminants in point source discharges on fresh water quality and aquatic ecosystems is avoided, remedied, or mitigated, and allow for reasonable mixing.
- Policy 8 – Promote the retirement and planting of riparian margins for various purposes maintaining or enhancing water quality and encouraging healthy functioning of aquatic and riparian ecosystems.
- Policy 9 – To avoid, remedy, or mitigate the adverse effects of modification of river beds on water quality, aquatic ecosystems, and the amenity and cultural values of water.
- Policy 11 – Any adverse effects on amenity or intrinsic values of ecosystems are avoided, remedied, or mitigated.
- Policy 12 – To avoid, remedy, or mitigate any adverse effects on natural character of wetlands, lakes, or rivers and their margins.
- Policy 13 – To recognise cultural relationship of tangata whenua with rivers including managing significant sites.
- Policy 15 – Protect water resources used for public water supply.

4.3 Relevant Provisions in the Regional Freshwater Plan for the Wellington Region

The Regional Freshwater Plan (RFP) outlines the issues, objectives, policies, rules, and methods for managing freshwater resources in the Wellington Region.

Section 4 of the RFP outlines general provisions for the use and development of fresh water resources. These general provisions are grouped into tangata whenua values, natural values, amenity values, and use and development – nearly all of which are relevant in some way to these applications. The policies that are pertinent to these applications are:

- Policy 4.2.1 – Manage sites of special value to tangata whenua
- Policy 4.2.4 – Avoid, remedy, or mitigate any adverse effects on habitats of species traditionally harvested by tangata whenua.
- Policy 4.2.5 – Have regard to values and customary knowledge of tangata whenua.
- Policy 4.2.9 – Have regard to natural characteristics of wetlands, rivers, lakes and their margins. In particular ecosystems, habitats and species, water quality, natural flow characteristics and hydraulic processes, and topography and physical composition of the environment.
- Policy 4.2.11 – Avoid, remedy or mitigate the adverse effects of the use and development of water bodies on aquatic habitats and freshwater ecosystems by having regard to maintenance of biological and physical processes, habitat, diversity, fish movement and spawning, and prevention of irreversible adverse effects.
- Policy 4.2.12 – Promote maintenance and enhancment of aquatic habitats and ecosystems when considering adverse effects outside of river and lake beds.
- Policy 4.2.13 – Protect nationally threatened freshwater fauna (*includes Tauherenikau River for koaro, shortjawed kokopu, giant kokopu, brown mudfish, and banded kokopu*)
- Policy 4.2.14 – Avoid, remedy, or mitigate any adverse effects on important trout habitat (*includes Tauherenikau River, Otakura Stream, Dock Creek, and Waiohine River*) by having regard to other water quality and quantity policies (*see policy 5.2.3 and 6.2.1*)
- Policy 4.2.15 – Avoid, remedy, or mitigate any adverse effects on regionally important water bodies for their amenity and recreational values *(includes Waiohine River for rafting, kayaking, canoeing, and angling)* by having regard to other water quality and water quantity policies (*see policies 5.2.4 and 6.2.1*), and the timing of the use and development of the water body.
- Policy 4.2.23 –Have regard to the benefits arising from the proposal.
- Policy 4.2.24 – Have regard to effects on other established activities.
- Policy 4.2.25 – Encourage users of fresh water to adopt an ethic of guardianship for future generations.
- Policy 4.2.26 – Adopt a precautionary approach where information is incomplete or limited.
- Policy 4.2.29 – Recognise needs of existing lawful users by allowing progressive upgrades in environmental performance.
- Policy 4.2.31 – Ensure that the process for making decisions is fair and transparent.
- Policy 4.2.32 – Encourage the development of "Codes of Practice" and "Guidelines".
- Policy 4.2.33 – Provide for activities which have no more than minor adverse effects on the environment.
- Policy 4.2.34 – Avoid, remedy, or mitigate any adverse effects on cultural, natural, amenity, and recreational values by placing conditions on resource consents.
- Policy 4.2.35 & 4.2.36 – Matters to have regard to when placing conditions on resource consents.

Section 5 of the RFP outlines issues, objectives, policies, and methods for water quality. Relevant policies in this section are:

- Policy 5.2.3 – Manage water quality *in the Tauherenikau River, Otakura Stream, Dock Creek, and Waiohine River* for trout fishery and fish spawning purposes.
- Policy 5.2.4 – Manage water quality *in the Waiohine River* for contact recreation purposes.
- Policy 5.2.6 –Manage water quality all watercourses *except the Waiohine River* for aquatic ecosystem purposes.
- Policy 5.2.8 –Have regard to Water Quality Guidelines in *Appendix 8* of the RFP.
- Policy 5.2.9 –Enhance the water quality *in the Waiohine River* for contact recreation purposes.
- Policy 5.2.11 – Factors to consider when determining mixing zone for any discharge standards on any receiving waters.

Section 6 of the RFP outlines issues, objectives, policies, and methods for water quantity and the taking of fresh water. Relevant policies in this section are:

- Policy 6.2.1 – Manage the allocation of water and flows *in the Waiohine and Tauherenikau Rivers* by recognising the minimum flow, authorising the taking of no more than the core allocation, authorising the taking of a supplementary allocation, and authorising the taking of no more than the first and second stepdown allocations.
- Policy 6.2.5 – Give priority over other users to abstraction of water for public health needs of people.
- Policy 6.2.6 –Allocate water for irrigation (subject to Policy 6.2.1) up to a maximum rate of 350 m^3/hectare/week.
- Policy 6.2.7 –Encourage the use of groundwater as an alternative to surface water.
- Policy 6.2.9 – Encourage and support "user committees" to assist in managing the taking and use of fresh water.
- Policy 6.2.11 –Have due regard to the relevant provisions of the RFP when considering water permits for the take of water for water races.
- Policy 6.2.15 – Allow for diversion of water provided adverse effects are avoided, remedied or mitigated; and significant adverse effects are avoided on tangata whenua values, nature or amenity values, water quality and flows, biological and physical processes, sediment transport processes, and fish passage.
- Policy 6.2.16 –Ensure that, for any proposal to divert water between catchments, there has been consultation with the tangata whenua in accordance with tikanga Maori.
- Policy 6.2.18 – Have regard to whether the amount of water required is reasonable given the intended use, and the need for accurate measurement of the take.
- Policy 6.2.19 – Encourage water conservation, particularly in water short areas.

Full details of relevant policies in the RPS and RFP, and sections 104 and 107 of the RMA (including Part II of the Act) can be provided on request.

5.0 Assessment of Actual and Potential Effects

The applicant submitted a combined `Assessment of Environmental Effects' (AEE) report for the Moroa and Longwood water races. This section provides an assessment of the AEE report and other information available to Greater Wellington on potential environmental effects associated with the activity. The assessment of actual and potential effects is grouped into the following broad categories:

- Positive effects
- Effect of taking and diverting water on the Waiohine and Tauherenikau Rivers

- Effect of discharges on the receiving water environment
- Effect of maintenance activities and structures in the Waiohine and Tauherenikau Rivers
- Water efficiency and alternative methods
- Tangata whenua values

5.1 Positive Effects of Water Race Systems

Although the AEE report does not explicitly list the positive effects of the Moroa and Longwood water races, there are a number eluded to in the AEE report and also stated in submissions including:

- The water races provide a water supply for stock water, irrigation, some domestic use, and fire-fighting.
- The recharge of water lost from the water races to local groundwater aquifers.
- Tail races augmenting local stream flows.
- Providing stormwater drainage during winter.
- Amenity, aesthetic, and economic value to properties the water races serve.
- Helps maintain aquatic habitat in the water races and associated wetlands.
- Maintain equilibrium between rivers, streams, and groundwater established over the last 100 years.

A number of these positive effects (such as aquifer recharge, economic value, and aquatic habitat) have not been quantified with formal studies. Nevertheless there is strong anecdotal evidence for these effects, and Policy 4.2.23 of the RFP requires the Council to consider the benefits of any proposed activity.

5.2 Effects of taking and diverting water from the Waiohine & Tauherenikau Rivers

5.2.1 Nature of Source Waters - Waiohine and Tauherenikau Rivers

The AEE report describes the **Waiohine River** as a mountain river emanating from the Tararua Ranges. Below the abstraction point the river meanders east then south and joins the Ruamahanga River. The river is important for trout habitat (as identified in policy 4.2.14 of the RFP) and is considered regionally important for its amenity and recreational values, particularly rafting, tubing, kayaking, and angling. This is reinforced in the fact that policy 5.2.9 of the RFP identifies in the Waiohine River for water quality enhancement for contact recreation purposes. Policy 6.2.1 of the RFP specifies a core allocation, minimum flow, stepdown allocation levels, and supplementary flow level for the Waiohine River as outlined in Table 5 below:

Table 5: Water Allocation Mechanisms in RFP (Policy 6.2.1) - Waiohine River

	Minimum Flow (litres/sec)	**Core Allocation** (litres/sec)	Flow required for **supplementary allocation** (litres/sec)	Flow below which **first stepdown** allocation takes effect (litres/sec)	**First stepdown** allocation (litres/sec)	Flow below which **second stepdown** allocation takes effect (litres/sec)	**Second stepdown** allocation (litres/sec)
Waiohine River from the headwaters to the confluence with the Ruamahanga River	2300	740	4000	3040	500	0	0

A similar description is given of the **Tauherenikau River** in the AEE report. From the abstraction point the river flows briefly east and then south to Lake Wairarapa. The river is important for both trout habitat (as identified in policy 4.2.14 of the RFP) and native fish species, particularly koaro, shortjawed kokopu, giant kokopu, brown mudfish, and banded kokopu (as identified in policy 4.2.13 of the RFP). Policy 6.2.1 of the RFP specifies a core allocation, minimum flow, stepdown allocation levels, and supplementary flow level for the Tauherenikau River as outlined in Table 6 below:

Table 6: Water Allocation Mechanisms in RFP (Policy 6.2.1) – Tauherenikau River

	Minimum Flow (litres/sec)	**Core Allocation** (litres/sec)	Flow required for **supplementary allocation** (litres/sec)	Flow below which **first stepdown** allocation takes effect (litres/sec)	**First stepdown** allocation (litres/sec)	Flow below which **second stepdown** allocation takes effect (litres/sec)	**Second stepdown** allocation (litres/sec)
Tauherenikau River from the headwaters to the confluence with the Ruamahanga River	1100	405	2000	1350	350	1300	155

5.2.2 Identified potential effect of taking and diverting water

The AEE report identified the following potential effects of the water takes for the Moroa and Longwood water races:

- Less water being available for other activities such as irrigation and industrial use.
- Less water being available for domestic consumption from the town water supply.
- Less water available for recreational activities and as an amenity.
- Distress created on aquatic ecosystems.

In general this is a good summary of the potential effects on the water takes. Unfortunately the AEE report primarily evaluated these potential effects by assessing the effect on the flow regimes of each river only. What follows is a more detailed assessment of the potential effects of taking and diverting water from the Waiohine and Tauherenikau Rivers. This is based on information provided in the AEE report as well as additional information held by Greater Wellington.

5.2.3 Assessment of potential effects of taking and diverting water on the flow regime of the Waiohine River

SWDC have proposed a modified abstraction regime for the Moroa water race. This is expressed in Table 7 below alongside an assessment of the percentage of flow taken from the Waiohine River.

Table 7: Current & Proposed Abstraction Regime for Moroa Water Race

Waiohine River flow @ Gorge (litres/sec)	**Current abstraction allowed (litres/sec)**	**Proposed abstraction (litres/sec)**	**Proposed abstraction %**
Below 2300	500	350	> 15.2 %
2300 – 3040	500	400	13.2% - 17.4%
3040 – 4000	500	450	11.3% - 14.8%
Above 4000	500	500	< 12.5%
Above 7000	600	Not specified	-

The Waiohine River falls below 3.12 cumecs (3120 litres/sec) only 1% of the time i.e. approximately 3 days/year. This flow level is approximate to the 1 day Mean Annual Low Flow (MALF)[1]. Hence for the majority of the time, less than 15% of the flow in the Waiohine River will be taken. In terms of the mean monthly flow in the Waiohine River, the proposed abstraction rate of 0.5 cumecs represents 10% of the lowest mean monthly flow recorded in February 1994. The effect downstream could be greater as studies have shown that the Waiohine River can lose up to 1 cumec to groundwater[2].

The potential cumulative effects of all consented takes in the Waiohine River is slightly greater than that identified above. An additional 233 litres/sec is allocated to other resource consents, the majority (180 litres/sec) to the SWDC Greytown-Featherston public water supply. These resource consents are listed in Table 8 below:

Table 8: Current & Proposed Allocation of Water from Waiohine River

Consent No.	Consent Holder	Watercourse	Vol. (l/sec)	Vol. (m^3/day)
WAR980212	Berthold T & J	Spring Fed Drain	2.5	216
WAR990142	SWDC (	Waiohine River	180.0	15552
WAR010164	Bell H & M	Waiohine River	23.6	1699
WAR010173	Craig B J	Waiohine River	12.0	994
WAR010200	SWDC	Waiohine River	450.0	43200
WAR010065	Wairarapa Aggegrates Ltd	Waiohine River	15.0	486
		Total allocated volume:	**683**	**62147**

If this application were granted, the total consented takes from the Waiohine River will be 683 litres/sec when the flow in the river is below 4000 litres/sec. This equates to approximately **22%** of the 1-day MALF.

The proposed abstraction regime fits within minimum flow and core allocation provisions outlined in policy 6.2.1 of the RFP. The maximum core allocation is 740 litres/sec, and if this application were granted the total core allocation would be 683 litres/sec. When the flow in the Waiohine River falls below 3040 litres/sec, the core allocation is to be reduced to 500 litres/sec. The proposed abstraction regime outlined in the AEE report and in Table 7 is consistent with this requirement in policy 6.2.1. This is provided that the combined abstraction rate for the Moroa water race and the Greytown-Featherston public water supply does not exceed 500 litres/sec.

The effects of diverting up to 1000 litres/sec into a diversion channel which runs parallel to the Waiohine River for approximately 600 metres will result in approximately 30%-40% of the flow being taken from the Waiohine River at extreme low flows. This is a temporary effect for approximately 600 metres. In reality the actual amount of water is likely to be considerably less than the 1000 litres/sec applied for, as the flow entering the diversion channel will decline as the flow in the river declines.

5.2.4 Assessment of potential effects of taking water on aquatic ecosystems, water quality, and recreational/amenity values in the Waiohine River

The Waiohine River supports an important trout habitat as previously highlighted. Jowett (1993) provided minimum flow assessments for instream habitat in a number of rivers in the Wellington region including the Waiohine River[3]. In summary, Jowett stated that generally in larger rivers such as the Waiohine River, the two-thirds food producing guideline tends to determine minimum flows.

[1] The 1 day Mean Annual Low Flow (MALF) is defined as the average of the lowest 1 day flows recorded in each calendar year at a particular monitoring site.
[2] Water Resources Management Plan for the Waiohine Water Resource Region (1980) - Wairarapa Catchment Board and Regional Water Board.
[3] Jowett, I G (1993) – Minimum Flow Assessment for Instream Habitat in Wellington Rivers. NZ Freshwater Miscellaneous Report No. 63

The minimum flow to maintain two-thirds food producing habitat was 44% of the MALF or 1343 litres/sec. The minimum flows specified in the RFP therefore are possibly conservative in relation to the effects on trout habitat. However a more detailed IFIM study on the whole Waiohine River would provide better information to determine whether the existing minimum flows are appropriate or otherwise.

Baseline water quality monitoring is completed on Waiohine River upstream of the abstraction site at the Gorge flow monitoring site and downstream of the abstraction at Bicknells which is immediately upstream of the confluence with the Ruamahanga River. I have evaluated results from monitoring undertaken between 1999 and 2001. During that period no exceedances in aquatic ecosystem guidelines were recorded at both sites. Parameters recorded included dissolved oxygen, pH, total ammonia, temperature, periphyton, and dissovled nutrients.

In general water quality at the Gorge site is good with an average macroinvertebrate community index (MCI) value greater than 120, for the monitoring period February 1999 – March 2001. At the Bicknells site water quality is poorer with possible mild pollution detected as the MCI value is between 100-120. Nevertheless the water quality is still better than other sites in the Wairarapa valley.

Despite deterioration in water quality being observed upstream and downstream of the abstraction point, the abstraction itself is unlikely to play a significant role in this deterioration. Land use activities are likely to play a more dominant role as the Gorge site is located in a pristine unmodified vegetated catchment, whilst the Bicknells site is located downstream of a reasonable large area of agricultural and urban land use. This contributes non-point source discharges and point source discharges such as Carterton sewage.

The Waiohine River has regionally significant recreational values for rafting, kayaking, canoeing, and angling. There are also popular swimming holes in the Waiohine River, notably around the Waiohine Gorge and SH2 bridge. Only recreational values downstream of the abstraction point could be potentially affected by the abstraction. Most rafting, canoeing, and kayaking occurs upstream of the abstraction, hence I would not expect values to be adversely affected. As discussed previously trout habitat are unlikely to be adversely affected by the abstraction hence angling values should also not be adversely affected. Swimming holes could be affected by reduced flows in the Waiohine River. Given that water quality for recreational bathing is not adversely affected in the Waiohine River as discussed earlier, I do not consider the minor reduction in flow to adversely affect these recreational users.

5.2.5 Assessment of potential effects of taking and diverting water on the flow regime of the Tauherenikau River

SWDC have proposed a modified abstraction regime for the Longwood water race. This is expressed in Table 9 below alongside an assessment of the percentage of flow taken from the Tauherenikau River.

Table 9: Current & Proposed Abstraction Regime for Longwood Water Race

Tauherenikau River flow @ Gorge (litres/sec)	Current abstraction allowed (litres/sec)	Proposed abstraction (litres/sec)	Proposed abstraction %
Below 1100	100	100	> 9.1 %
1100 – 1350	100	100	7.4% - 9.1%
1350 – 2000	200	180	9% - 13.3%
Above 2000	250 - 400	250	< 12.5%

The above table is based on information presented in the AEE report. The current abstraction allowed under the existing resource consent is actually only 200 litres/sec and not 250-400 litres/sec. The existing consent previously allowed for the taking of up to 400 litres/sec however this was partially surrendered by SWDC (or its predecessor) when resource management charges came into force.

The Tauherenikau River falls below 1.1 cumecs (1100 litres/sec) approximately 2% of the time i.e. approximately 6 days/year. This flow level is approximate to the 1 day Mean Annual Low Flow (MALF). Hence for the majority of the time, less than 15% of the flow in the Tauherenikau River will be taken. In terms of the mean monthly flow in the Tauherenikau River, the proposed abstraction rate of 0.25 cumecs represents 17.5% of the lowest mean monthly flow recorded in February 1985.

The effect downstream could be greater as the flow in the Tauherenikau River has ceased on occasions in the vicinity of the SH 53 bridge. This is over 8 km downstream of the abstraction point, and given that there are at least 3 discharges from tail races of the Longwood water race and one discharge from a tail race of the Moroa water race upstream of this area, it is unlikely that the taking of water for the Longwood water race would play a significant role in the Tauherenikau River drying up around SH 53. Natural conditions are likely to play a more significant role as the bed of the Tauherenikau River is known to be aggrading in this section which could cause the river to flow sub-surface on a more frequent basis.

In terms of the potential cumulative effects of all consented takes, the only other resource consents to take water from the Tauherenikau River or its tributaries are issued to the Wairarapa Jet Sprint Club and SWDC. The Wairarapa Jet Sprint Club take up to 30 litres/sec for 4 days/year to fill a jet sprint pond at Tauherenikau racecourse. The SWDC take up to 60 litres/sec from Taits Creek (which is upstream of the Gorge monitoring site) for an emergency water supply for Featherston. Given that both of these resource consents are intermittent, I consider that the cumulative effects of all takes are no greater than the individual effect of the Longwood water race.

The proposed abstraction regime fits within minimum flow and core allocation provisions outlined in policy 6.2.1 of the RFP. The maximum core allocation is 405 litres/sec, and if this application were granted the total core allocation would be 290 litres/sec. When the flow in the Tauherenikau River falls below 1300 litres/sec, the core allocation is to be reduced to 155 litres/sec. The proposed abstraction regime outlined in the AEE report and in Table 9 is consistent with this requirement in policy 6.2.1.

The effects of diverting an additional 200 litres/sec into a diversion channel will affect approximately 1 km of the Tauehereniakau River. This will result in approximately 20% of the normal summer flow (of 2000 litres/sec) being taken from the Tauherenikau River. As progressive stepdown allocations will be implemented below this flow the amount of water diverted is likely to be less as well, hence I would expect that no more than 20% of the river flow will be diverted during extreme low flows also. This is a temporary effect for approximately 1 km.

5.2.6 Assessment of potential effects of taking water on aquatic ecosystems, water quality, and recreational/amenity values in the Tauherenikau River

The Tauherenikau River supports an important trout habitat and has nationally recognised native fish species recorded in the catchment as previously highlighted. Jowett (1993) provided minimum flow assessments for instream habitat in a number of rivers in the Wellington region including the

Tauherenikau River[4]. In summary Jowett stated that in smaller rivers such as the Tauherenikau River the minimum food producing and adult brown habitat (WUA) tends to determine minimum flows. The minimum flow to maintain this requirement is 64% of the MALF or 666 litres/sec. The minimum flows specified in the RFP therefore are possibly conservative in relation to the effects on trout habitat. In terms of the potential effects on native fish species, it is generally recognised that native fish species can sustain lower minimum flows than trout habitat.

A more detailed IFIM study on the whole Tauherenikau River would provide better information to determine whether the existing minimum flows are appropriate or otherwise. It is possible that minimum flows could be higher given that flows losses identified downstream.

Baseline water quality monitoring is completed on Tauherenikau River downstream of the abstraction site close to the Tauherenikau delta on Lake Wairarapa. I have evaluated results from monitoring undertaken between 1999 and 2001. During that period there were three exceedances in aquatic ecosystem guidelines. Two exceedances in periphyton growths and one exceedance in dissolved nutrients was recorded. Parameters recorded included dissolved oxygen, pH, total ammonia, temperature, periphyton, and dissovled nutrients.

Possible mild pollution is detected at the Tauherenikau monitoring site as the MCI value is between 100-120. Nevertheless the water quality is still better than other sites in the Wairarapa valley and is comparable with the downstream Bicknells site on the Waiohine River.

The Tauherenikau River is not identified as having regionally significant recreational values There are some swimming holes in the Tauherenikau River, notably around the Gorge. Only recreational values downstream of the abstraction point could be potentially affected by the abstraction. Given that water quality for recreational bathing is not adversely affected in the Tauherenikau River as discussed earlier, I do not consider the minor reduction in flow to adversely affect these recreational users.

5.3 Effects of discharges on the receiving water environment

5.3.1 Nature of Receiving Waters

Tail races of the Moroa and Longwood water race discharge into a number of watercourses. The AEE report states that the Moroa water race discharges back to natural watercourses in 14 locations - 1 to the Waiohine River, 3 to the Papawai Stream, 4 to the Otakura Stream, 4 to Stonestead (or Dock) Creek, and 2 to the Tauherenikau River. In the case of the Longwood water race, the AEE report states that there are 7 discharge points – 5 to the Tauherenikau River and 2 to the Otauira Stream or Donalds Creek. This may not be totally correct as the exact location of both water races is questionable is some areas. This issue is discussed further in section 8.2 of this report. It was estimated that the amount of water discharged back to natural watercourses from the Morora water race was 100 litres/sec whilst in the case of the Longwood water race it is estimated that 50 litres/sec is discharged to natural watercourses. This has not been verified through flow gauging of the tail races.

The nature of the **Waiohine River** and **Tauherenikau River** has been previously discussed in section 5.2 of this report.

The **Papawai Stream** is a spring fed stream originating in the Greytown area. It is commonly recognised that the Papawai Stream and its tributaries is a discharge mechanism for the Greytown shallow aquifer. The land use in the entire catchment is agricultural and the Papawai Stream

[4] Jowett, I G (1993) – Minimum Flow Assessment for Instream Habitat in Wellington Rivers. NZ Freshwater Miscellaneous Report No. 63

receives effluent from the Greytown oxidation ponds near the confluence with the Ruamahanga River. The low summer flow in the Papawai Stream is approximately 200 litres/sec. Although a couple of targeted water quality studies have been completed on the Papawai Stream which show that parts of the stream have moderate levels of pollution, no regular water quality monitoring of the Papawai Stream is completed by Greater Wellington. There are no regionally significant values identified in the RPS or RFP for the Papawai Stream.

The **Otakura Stream** is a predominantly rainfall fed stream that originates in the southern Greytown / Papawai area and flows in a southerly direction into Lake Wairarapa. The land use in the entire catchment is agricultural. The low summer flow in the Otakura Stream is approximately 100 litres/sec. No water quality sampling is completed on the Otakura Stream.

Stonestead (or Dock) Creek is a rainfall and spring fed watercourse that originates in the vicinity of the intake to the Moroa water race. The catchment is entirely agricultural in land use character. At the lower end of Dock Creek the flow increases substantially as water is gained most likely from seepage from the Tauherenikau River. At this point the low summer flow in Dock Creek is approximately 500 litres/sec. No water quality sampling is completed in Dock Creek.

The **Otauira Stream** or **Donalds Creek** originates in the foothills of the Tararua Ranges between Featherston and the Tauherenikau River. It flows in a southerly direction and joins up with Abbotts Creek before entering Lake Wairarapa. The flow is predominantly influenced by rainfall. During dry summer periods, there is no flow in Donalds Creek until south of Featherston. Water quality monitoring in Donalds Creek is completed upstream and downstream of the Featherston oxidation ponds which discharge effluent into the creek. Water quality downstream of the oxidation ponds is considered very poor. In 2001 the MCI value indicated probable severe pollution. The tail races of the Longwood water race that discharge into Donalds Creek downstream of the Featherston oxidation ponds discharge.

5.3.2 Identified potential effects of discharges

The AEE report identified the following potential effects of the discharges for the Moroa and Longwood water races:

- Placing unnecessary strain on aquatic ecosystems at and below the point of discharge.
- Impacting on recreational and aesthetic values during periods of low flow.
- Impacting on the ability of the receiving waters to be used for stock watering purposes.

The above potential effects are likely to be as a result of non-point source pollution and stormwater runoff into the water race networks. Non-point source pollution includes land use activities in and surrounding the water race networks.

5.3.3 Effects of discharges from the Moroa water race

One positive effect of the discharge of water from the Moroa water race is that during low flow periods, flows in small streams are supplemented by residual flow from tail races. The greatest benefit is likely to be seen in the Otakura Stream catchment, which is subject to frequent low flow conditions.

To assess the potential effects of the discharge on water quality and aquatic ecosystems in the receiving waters, the applicant completed a water quality monitoring programme between August 2000 and June 2001. Unfortunately this programme was very limited and seemed to be quite random in nature. The effects of discharges were evaluated on two discharge sites, one of which

only one complete sample was taken, hence only early indications of the potential effects of the discharge can be assessed.

The AEE report said that there were two main types of discharge situations. The first was where the water race discharged into typical rural streams such as the Otakura Stream and Dock Creek. The AEE report said that water quality was occasionally poorer in these streams compared to the water race at the discharge point. The second situation is where the water race discharges into larger rivers. In the case of the Moroa water race there are two discharges to the Tauherenikau River and one discharge to the Waiohine River.

The potential effect on larger rivers was not specifically evaluated through water quality monitoring. However the potential effects can be somewhat described through baseline water quality monitoring completed in the Waiohine and Tauherenikau Rivers as previously discussed. That identified that there was water quality degradation between the Gorge and downstream sections of the Waiohine River. The contribution of the tail races as point source discharges will contribute to water quality degradation.

In terms of the potential effects on small streams, only one sampling site was monitored on all occasions. This site was a tail race that discharged into Dock Creek around SH 53. The data collected on six occasions showed that there was a minimal impact on the receiving water environment for all parameters tested (temperature, dissolved oxygen, faecal coliforms bacteria, nitrates, pH, conductivity, ammonia, and phosphorus). This is shown in the summarised results in Table 10 below:

Table 10: Mean Water Quality Results – Discharge from Site M24 to Dock Creek

Water quality parameter	Water race	Upstream of discharge	Downstream of discharge
Temperature	14.4	15.25	14.97
Dissolved oxygen	6.35	6.0	6.10
Faecals	796.4	1191.3	1075.8
PH	6.56	6.46	6.49
Conductivity	17.25	17.75	17.82
Nitrate nitrogen	1.88	2.95	2.56
Ammonia	0.25	1.18	0.26
Phosphorus	0.27	0.18	0.18

The water quality monitoring programme did show a deterioration in water quality between the intake and the discharge points. This is reflected in the summary of facael coliform bacteria data for all sites at various point along the water race network as shown in Table 11.

Table 11: Faecal Coliform Bacteria – Moroa Water Race

Faecals	M1	M2	M5	M12R	M22	M25	M24	M35	M32
	Top section of race			*Mid section of race*		*Bottom section of race*			
15-Aug-00	20							17600	
28-Aug-00	-						1000		
19-Jul-00	13								
24-Nov-00		43	111		196		396		
15-Dec-00		200		900		3200	1000		
29-Jan-01							186		
3-Apr-01	32								
10-May-01	50						1400		700
Average	*67*			*548*		*3185*			

The increase in bacterial pollution is likely to be due to intensive agricultural land use practices within the race system.

Although the AEE report states the effect of the discharges from the Moroa water race is minimal, I believe that this is insufficient information to confirm this.

5.3.4 Effects of discharges from the Longwood water race

Like the Moroa water race, one positive benefit of the discharge of water from tail races of the Longwood water race is that residual water supplements water to the Tauherenikau River and Donalds Creek. During low summer flows, this is likely to be of most benefit to Donalds Creek, which receives wastewater from the Featherston oxidation ponds.

To assess the potential effects of the discharge on water quality and aquatic ecosystems in the receiving waters, the applicant completed a water quality monitoring programme between July 2000 and July 2001. Unfortunately this programme was very limited and seemed to be quite random in nature. The effects of discharges were evaluated on two discharge sites – one into the Tauherenikau River around SH53, and the other into Donalds Creek downstream of the Featherston oxidation ponds. As no more than four samples were taken, only early indications of the potential effects of the discharge can be assessed.

In general there was a minimal effect on downstream water quality as a result of the discharges based on the water quality parameters tested (temperature, dissolved oxygen, faecal coliforms bacteria, nitrates, pH, conductivity, ammonia, and phosphorus).

What was evident during the montoring, was that water quality in both Donalds Creek and the water race entering Donalds Creek was very poor. The main reason why water quality in Donalds Creek upstream of the discharge points was the contribution of treated effluent from Featherston oxidation ponds.

Bacterial water quality significantly declined from the intake to the discharge points. This is shown on Table 12 below.

Table 12: Faecal Coliform Bacteria – Longwood Water Race

Faecals	L1R	L1	L2	L3	L11	L12	L13R	L7WR	L7ER
	Top section of race				*Tauherenikau River discharges*			*Donalds Creek discharges*	
19-Jul-00	4						44		
28-Aug-00					1000				
24-Nov-00		116			196	96			
15-Dec-00	40				1100				
3-Apr-01			10	10				3600	5600
10-May-01				120			3300	2400	
20-Jun-01				45					
2-Jul-01							400	1900	
Average	*49*				*876*			*3375*	

The increase in bacterial pollution is likely to be due to intensive agricultural land use practices within the race system.

Although the AEE report states the effect of the discharges from the Longwood water race is minimal, I believe that this is insufficient information to confirm this.

5.4 Effects of maintenance activities and structures in Waiohine & Tauherenikau Rivers

The AEE report stated that the potential effects of the structures in place and any maintenance activities will be minimal and that there would be no significant adverse effects. The applicant has appeared to have glossed over some potential effects and issues which are highlighted below.

5.4.1 Maintenance Activities

Maintenance activities involve the following:

- Clearing debris and gravel away from the intake grates located in the beds of the Waiohine and Tauherenikau Rivers.
- Maintaining a channel from the active flowing channel to the intake grate.
- Maintaining structures located in the beds of the Waiohine and Tauherenikau Rivers

The above maintenance activities will disturb the beds of the Waiohine and Tauherenikau Rivers. It is reasonable to expect that the maintenance activities will temporarily affect water quality. Any movement of bed materials will disturb fine silts and sands, which will increase suspended solids and raise turbidity levels. Also, the use of mechanical equipment in the river bed has the potential to release contaminants into the river environment. These effects are considered to be minor, provided that certain avoidance or mitigation measure are put in place. Any maintenance works should not affect fish passage as the active flowing channel will not be blocked.

The timing of the works could potentially affect public access and recreational users. Public access to the area of maintenance works is difficult, hence I consider the potential effects on recreational users to be minor and limited to kayakers, canoeing etc. The timing of the works could affect spawning for native fish and trout habitat. The RFP identifies both rivers as important for trout habitat and spawning. In addition to this, the RFP identifies the Tauherenikau River as important for native fish species. Any work in the river bed at this time should be avoided or minimised.

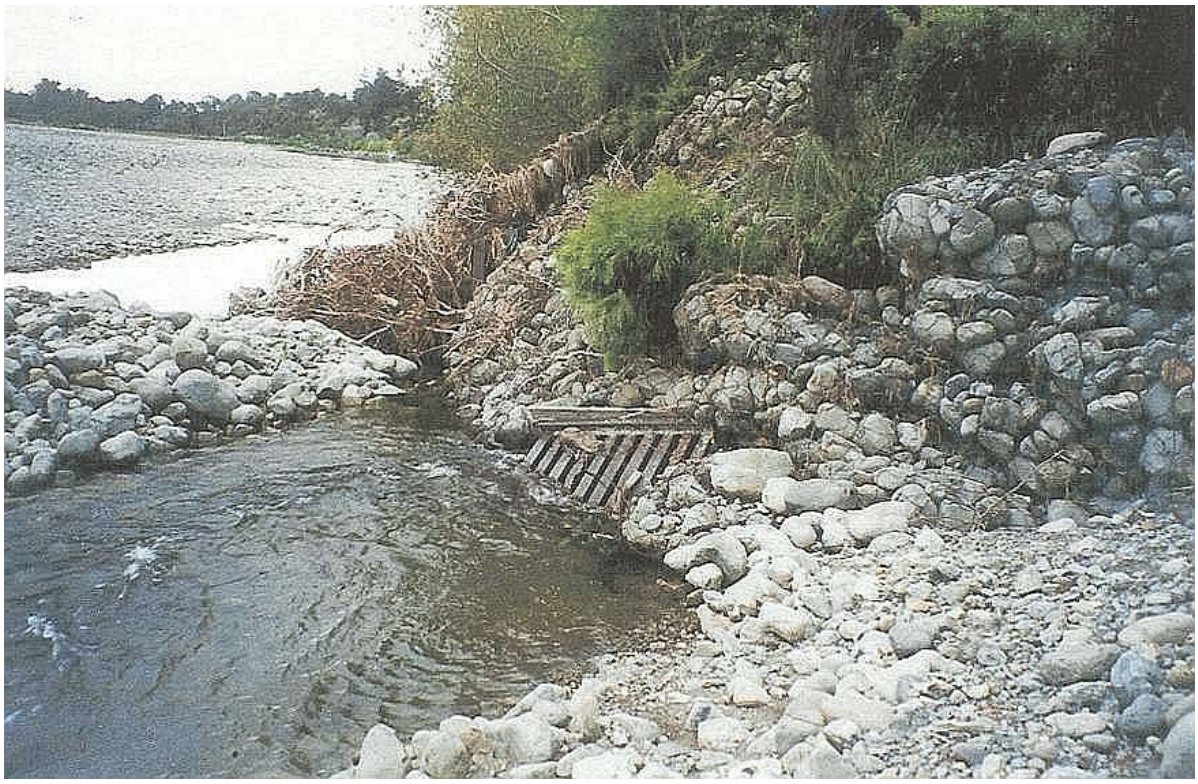
Due to the scale and nature of maintenance activities any potential effects on bird nesting sites are considered to be minor.

5.4.2 Structures

The intake to the Moroa water race has an intake grate in the bank of the Waiohine River as shown in Figure 5 on the following page. The actual diversion channel to the intake structure can be seen in Figure 1 earlier in this report.

In my view, this structure is unlikely to have an impediment to fish passage in the Waiohine River. Fish species could potentially migrate into the water race network, nevertheless this is not considered an adverse effect as there is still potential habitat in the water race network itself. As there is a diversion back to the Waiohine River fish can migrate back in the natural river environment. The structure is also not an impediment or hazard to recreational users provided the structure is appropriately marked.

Figure 5: Moroa Water Race Intake



The intake to the Longwood water race has an intake grate in the bank of the Tauherenikau River and a rock weir across the entire width of the Tauherenikau River as shown in Figure 6 below.

Figure 6: Longwood Water Race Intake

The above weir was put in place illegally in 1999 as a result of degradation in the bed of the Tauherenikau River. No resource consent was gained for the structure.

The weir structure has the potential to be an impediment to fish passage and is a restriction to recreational users on the Tauherenikau River. The Tauherenikau River is not identified as having regionally significant recreational values, hence the effect on recreational users should be minor.

5.5 Water efficiency and alternative methods

5.5.1 Efficiency of water races

The AEE report assessed the efficiency (i.e. the amount of water actually used) of both water water races to be between approximately 5%[5]. In the case of the Moroa water race this would equate to 25 litres/sec. A desk top study on actual use for stock water was made based on land area, stock numbers, and land use type. The actual daily usage was estimated to be 994 m^3/day or 11.5 litres/sec. Although the AEE report identified that up to 34.5 litres/sec could be taken for stock water by allowing for a peaking factor, I consider that the estimate of 11.5 litres/sec is more reasonable. This gives a water efficiency of between 2-3%.

The AEE report said that under low flow conditions approximately 100 litres/sec was discharged from the Moroa water race and 50 litres/sec was discharged from the Longwood water race. This has not been verified by flow gaugings, and I would expect that the actual discharge flow could be greater than this. Nevertheless a reasonable proportion of water is `lost' from the water race systems.

The water losses are likely to include evaporation, seepage through the channels to groundwater, and poor maintenance resulting in either increased seepage and over flow. The losses to groundwater are often cited as a positive impact of the water races. However, little data exists to support the claim that the water races recharge groundwater aquifers. In the Moroa area this is likely to be of little benefit, where the groundwater resource is limited and not extensively used.

5.5.2 Alternative options and methods

The AEE report attempts to address the issue of water efficiency through evaluating alternative options and methods. The main alternative option evaluated was shutting down the water races and replacing it with a piped system. The AEE report said that the majority of race users (67%) were in favour of maintaining the Moroa water race when surveyed in 1995. No such survey has been completed for the Longwood water race.

A piped community water system could increase water efficiency to 90%. The advantages and disadvantages of both a piped supply and the existing open channel supply were evaluated at length. Cost analysis showed that the average cost of a piped community water supply for both development and operating costs was $8600 per ratepayer per year. This compared to current costs of the open channel water race system of $1500 per ratepayer per year. Hence, the conclusion drawn in the AEE report was that a piped community water supply is not feasible in the short to medium term, due to the financial outlay required. I believe the cost analysis provided in the AEE report is somewhat subjective. It is interesting to note that the original cost estimate provided in the AEE report was $4000 per ratepayer per year. Following the pre-hearing meeting and revision of the AEE report, this figure has now more than doubled to $8600 per ratepayer per year.

In general, I believe the consideration of alternative options and methods provided in the AEE report was very limited. The applicant tended to focus on an `all or nothing' approach to assess alternative options and clearly is focussed on maintaining the status quo. Although the managers of

[5] This was based on a WRC report entitled `Wairarapa Water Race: Issues & Consent Requriement ' April, 1988.

the water race systems were asked if there were any redundant sections of the water race, no studies have been completed to assess the actual need and reliance of the water race for domestic and stock water purposes.

5.5.3 Efficiency of irrigation takes

Two tail races of the Moroa water race are used by two landowners for irrigation purposes. These are existing takes that have operated for a number of years. The first take by J J Vollebregt is from a tail-race which discharges into a tributary of Dock Creek. The maximum rate of take is for 17.5 litres/sec, for 22 hours/day, 7 days/week, between October and April inclusive. The second take by N Svenson is from a tail-race which discharges into the Otakura Stream. The maximum rate of take is for 4 litres/sec, for 12 hours/day, between November and April inclusive. There are no irrigation takes from the Longwood water race.

In general, I consider that existing irrigation takes from the Moroa water races are inefficient in that considerably greater volumes of water are needed to be directed to the irrigation intakes than what would normally be expected from an irrigation take from a direct source of water such as a groundwater bore or river/stream intake.

5.6 Effects on tangata whenua values

Rangitaane o Wairarapa and Ngati Kahungunu ki Wairarapa were both consulted prior to the applications being lodged. Rangitaane o Wairarapa made a submission in opposition to the applications. Ngati Kahungunu ki Wairarapa stated in a letter (not considered a formal submission) stating that they had no concerns with the application. Likewise, although not submitting a formal submission, the SWDC Maori Standing Committee commented on the applications and generally supported the applications subject to the water races being fenced.

Concerns of Rangitaane o Wairarapa, as expressed in their submission, have been incorporated into this report. Other than stating that some preliminary consultation was undertaken, the AEE report did not address tangata whenua values.

Relevant tangata whenua values include:

- The relationship with traditional sites used for food gathering
- The relationship with ancestral sites, waahi tapu and other taonga
- The mauri (‘life essence’) of water bodies.

Tangata whenua concerns are likely to relate to:

- The reduction in water quantity in the Ruamahanga River during times of low flow;
- The protection of the river for use by future generations;
- The potential reduction in water quality of the races and resulting impact on receiving waters; and
- The mixing of waters from different catchments.

The impacts of the proposed take on water quantity have been discussed in section 5.2 of this report. The RFP aims to protect instream and spiritual and cultural values through the establishment of a minimum flow and progressive reductions in water takes during low flow periods. I believe that tangata whenua concerns over water quantity can be addressed by ensuring consistency with the policy 6.2.1 of the RFP.

The artificial mixing of waters is of major concern to tangata whenua. Although this concern should not be dismissed, it is difficult to address as to avoid this occurring the races would need to be closed or redesigned. Given that the receiving waters do enter the Ruamahanga River (i.e. they are tributaries rather than a completely separate catchment), the water races are unlikely to conflict with tangata whenua values as strongly as it would if the two catchments were completely separate.

The water quality issues associated with the water races were discussed in section 5.3 of this report. Rangitaane o Wairarapa expressed concern over management of the water races in relation to water quality, and stated that they would like to see water quality improved. The planting of riparian vegetation and reduction in stock crossings were suggested as methods of achieving this outcome.

6.0 Discussion of assessment of applications

6.1 Summary of assessment of applications

The assessment of the potential effects of the resource consent applications outlined in section 5 of this report can be summarised as follows:

- The taking of water fits within core allocation and minimum flows for the Waiohine and Tauherenikau Rivers as defined in the policy 6.2.1 of the RFP.
- The taking of water should not adversely affect aquatic ecosystems and water quality based on information available at the present time.
- The diversion of additional water to the intake control structure has a temporary affect on a short stretch of both rivers.
- The AEE report stated that the discharges to a number of watercourses has a minor effect on the water quality in the receiving water, although too few samples have been taken to be confident of this potential effect.
- The bacterial quality of water in the water race systems deteriorates markedly over the length of water race network.
- Maintenance works required to ensure water is delivered to the intake control structure are of a small scale and is associated effects are considered to be minor.
- The structure placed in the bed of the Tauherenikau River could be a barrier to fish passage.
- It is estimated that less than 5% of the water taken from the Waiohine and Tauherenikau Rivers is actually consumed. A significant proportion of water is lost to evaporation, seepage to groundwater and surrounding land.
- No concerted attempt has been made to investigate alternative options. A desktop study has been completed to cost a fully piped water supply. Cost estimates seem high and no consideration has been given either reducing the water race network or shutting down the water race and supplying to small piped system in certain areas where there is no alternative water source.

6.2 Should the applications be granted or declined?

In my opinion, the key issues arising out of the assessment of the resource consent applications is the fundamental question of whether the water should be taken for the intended purposes given the highlighted water efficiency issues. Secondly, the effect of the discharges is somewhat unclear at this point.

Due to the inefficient nature of water resource use for the water races, this does not promote the sustainable management of natural and physical resources, which is the cornerstone of Part II of the RMA in Section 5(1). Furthermore in Section 5(2)(a) there is a requirement to meet the reasonably

foreseeable needs of future generations and also in Section 7(b) of the RMA clearly states that Greater Wellington is to have particular regard to the efficient use of natural and physical resources. The inefficient use of water is inconsistent with Policy 2 of the RPS and policy 6.2.18 of the RFP. Hence on face value, the applications for taking water could be justified to be declined on water efficiency grounds.

In terms of the effects of the discharges, due to the incomplete information about the potential effects it is a difficult task to determine whether the quality of fresh water (as a result of the discharges) in the various receiving water environments safeguards the life supporting capacity, and meet needs of future generations as required under objective 2 and policy 4 of the RPS. Policy 4.2.26 requires Greater Wellington to take a precautionary approach where information (such as in this case) is incomplete or limited. A conservative approach would be to decline the discharge permit applications until such time that further information is gained on the effects of the discharges.

In weighing up the above matters, there are also a number of policies in the RPS and RFP that favour the granting of the applications. There are many policies that provide for activities provided that any adverse effects are avoided, remedied, or mitigated (policies 6, 9, 11, and 12 in the RPS, and policies 4.2.11, 4.2.14, 4.2.15, and 4.2.34). Furthermore, other policies allow for improvements in water quality and environmental performance for existing lawful activities (policy 5 of the RPS, and policy 4.2.29 of the RFP). It is important in this case to take into consideration the long standing nature of the water race systems, the positive benefits of the water races, and all other potential effects on the environment as a result of the activity that are considered to be minor.

Hence it is my view that that in weighing up the potential adverse effects of the proposed activity (particularly the issues of water efficiency and effects of the discharges), against the positive benefits of the continued operation of the water races, I believe the resource consent applications made should be granted. This can only occur however, with appropriate consent conditions to ensure that any potential adverse effects are avoided, remedied, or mitigated.

6.3 How long should consents be granted for?

Given the recommendation to grant the resource consent applications, the first key decision in this recommendation is how long the consents should be granted for? The applicant has requested a 20 year consent term for all the applications made. In my view the consents for the Longwood water race should be granted for a 15 year term, whilst the consents for the Moroa water race should be granted for a 20 year term for the following reasons:

- A few submitters who opposed the applications, requested a 10 year consent term. A 20 year term as requested by the applicant, is significantly greater period that those who are concerned about the ongoing operation of the Moroa and Longwood water races. In the case of the Moroa water race, Greater Wellington believes that 20 years is appropriate, with review clauses, as the impact of this race systems on the Waiohine River is less than the impact of the Longwood water race on the Tauherenikau River. In the case of the Longwood water race as well as the greater impact on the Tauherenikau River, the amount of water taken in proportionally greater (when assessing property coverage)
- Normally consents for taking water and discharging contaminants to water are for a maximum of 10 years. Given that the purpose of the consent is for a long standing activity for the benefit of an extensive community, a consent term of longer than 10 years is considered appropriate.
- The granting of the water take applications will `lock up' a reasonable proportion of the core allocation for the Waiohine and Tauherenikau Rivers. Given that the use of water has been

assessed as being inefficient, a shorter consent term is considered necessary for the Longwood water race.

7.0 Mitigation measures and proposed consent conditions including monitoring

7.1 Mitigation measures proposed by SWDC

SWDC have proposed a number of mitigation measures (including monitoring) that will avoid, remedy, or mitigate any potential adverse effects on the environment. These include:

- Progressive stepdown allocations when the Waiohine and Tauherenikau Rivers are subject to low flows.
- Implement a Code of Practice that will assist in improve water efficiency and the quality of discharges to natural watercourses.
- Periodic manual reading of a staff gauge at the intake to both water races, including recalibration of rating curve for staff gauge if required.
- Annual questionnaire to ratepayers on stock numbers.
- Monitor Greater Wellington flow information for the Waiohine and Tauherenikau Rivers.
- Regular monitoring programme of water quality at discharge points. Two sites on each of the water races are proposed to be monitored on a 6 monthly basis for a range of water quality parameters.

No mitigation measures were proposed to deal with any potential adverse effects as a result of the maintenance activities and structures located in the beds of the Waiohine and Tauherenikau Rivers. Also no mitigation measures were proposed to deal with any potential adverse effects as a result of the diversion of additional water to the intake control structures for both water races.

A Code of Practice (CoP) has been submitted with the resource consent applications. Its purpose is to minimise both wastage of water and input of contaminants from various farming and land use activities within the water race systems. The CoP is based on encouraging "best practical means" to meet the desired purpose of the CoP and it is a voluntary document. Some best practical means referred to in the CoP include:

- Fencing off the race and pumping water from the race to stock troughs.
- Locating an electric wire along the centre of the race to avoid stock wading and wallowing in the race.
- Stocking paddocks with stock which do not stand in the race.

The above mitigation measures are discussed in conjunction with consent conditions proposed by Greater Wellington. Although I support the proposed mitigation measures proposed by SWDC, there are many other matters that need to be addressed to ensure the any adverse effects are avoided, remedied or mitigated.

7.2. Proposed consent conditions

7.2.1 Water permits to take and divert water

I am satisfied with the mitigation measures proposed by SWDC in regard to the proposed stepdown allocations. In addition to this mitigation measure, an additional consent condition is proposed that

regulates the combined rate of abstraction from the Moroa water race and the Greytown-Featherston public water supply should not exceed 500 litres/sec when the flow in the Waiohine River is less than 3040 litres/sec at the Gorge monitoring site. This ensures compliance with policy 6.2.1 of the RFP.

To increase and promote water efficiency, I would recommend that the SWDC complete an audit of water efficiency in the water race networks within 4 years of the consents becoming operative. A key part of this review is completing a field survey to assess the level of use and dependency of the Moroa and Longwood water races. Every property will need to be surveyed and information collected on matters such as stocking rates (which the applicant has proposed to do an annual basis in any case), other alternative supplies available etc. It was hoped that this exercise would have been completed as part of this resource consent application process in order to justify the amount of water required.

A proposed consent condition requires all water to be maintained in the water race channel. No overland flow out of any water race channel is permitted, except when there is high flow in the races due to either high flows in the Ruamahanga River or high intensity rainfall events where stormwater runoff is elevated.

The use of water from the water race is regulated by a proposed consent condition. The water races should only be used for domestic and stock water purposes apart from the irrigation uses specified in AEE report. In principle I believe that the use of water races for irrigation purposes is inefficient, as larger volumes of water are required to travel to the irrigation intakes than is practically necessarily. Also the security of supply for such irrigation takes is questionable. There are two irrigation takes from tail races of the Moroa water race by N Svenson and J J Vollebregt. They are regulated as residual water in the tail races can significant supplement low flows in natural watercourses and any taking of water upstream will have a potential adverse effect on low flows in these natural watercourses. There are no irrigation takes from any tail races of the Longwood water race. If any person wishes to irrigate out the water race network or use water for any non-standard purpose, then the SWDC will need to apply for a variation of consent conditions.

In terms of the diversion of water to mitigate the potential adverse effect of a significant proportion of the active flow channel in the Waiohine and Tauherenikau Rivers being diverted, a consent condition is proposed to regulate the amount of water diverted. In the case of the Moroa water race no more than 30% of the active flowing channel in the Waiohine River can be diverted. In the case of the Longwood water race no more than 20% of the active flowing channel in the Tauherenikau River can be diverted. More water is required to be diverted into the Moroa water race because this water race is larger and the diversion is also required for the Greytown-Featherston public water supply. Also a consent condition is proposed that requires the amount of water diverted to be minimised as far as practicable.

In terms of monitoring the amount of water taken, the applicant has stated that they will take manual readings of a staff gauge at the intake to both water races. I believe that an appropriately constructed and maintained water flow monitoring site should be set up at the intakes and that the flow into the water races be monitored with an automatic recorder. Greater Wellington has a policy whereby all takes over 40 litres/sec are required to have a water meter. In the case of these two water races which are open channel systems, a water meter is not practically achievable, hence the rated flow monitoring site recommended, achieves the same purpose. This site should be installed within 6 months of the consents becoming operative in accordance with various appropriate standards to ensure quality information is collected.

It is recommended that the applicant report results from the water flow monitoring site to Greater Wellington every three months which includes the maximum, minimum, and average daily abstraction rate (in litres/sec). This reporting frequency and timing is the same standard for the Greytown-Featherston public water supply.

7.2.2 Discharge permits

As explained in section 4.1 of this report, under section 104(3) of the RMA Greater Wellington cannot grant a resource consent which is contrary to section 107 of the RMA. The minimum requirements of section 107 have been recommended conditions of consent, hence I am satisfied that section 104(3) has been appropriately considered.

Furthermore, under section 105(1) of the RMA, Greater Wellington is required to have regard to the nature of the discharge and sensitivity of the receiving environment and any possible alternative methods of discharge. There are a number of receiving environments of the discharges from the Moroa and Longwood water races including the Waiohine River, Papawai Stream, Otakura Stream, Dock Creek, Tauherenikau River and Donalds Creek. The most sensitive of these receiving environments in my opinion are the Papawai Stream, Otakura Stream, and Donalds Creek for the reasons outlined in Table 13 below.

Consideration was given to requiring water quality standards. Three options were considered including:

1. Standards on downstream receiving water environment.
2. Standards on the key representative discharges
3. Limits on water quality degradation between the intake and the discharge points.

Table 13: Assessment of Sensitivity of Receiving Water Environment

Receiving environment	Reason for sensitivity
Papawai Stream	• Catchment under pressure in terms of water takes • Stream receives discharge of effluent from Greytown oxidation ponds • Resource is important to local hapu at Papawai marae • GW currently promoting riparian enhancement in catchment
Otakura Stream	• Catchment under pressure in terms of water takes • Stream frequently falls into low flows during summer periods
Donalds Creek	• Catchment under pressure in terms of water takes • Stream frequently falls into low flows during summer periods • Creek received discharge of effluent from Featherston oxidation ponds

A discharge standard has not been recommended at this stage due to the current lack of information on effects of the discharges and the standard of water quality in the receiving environment.

As an alternative more focus should be placed on developing an appropriate water quality monitoring programme and ensuring the CoP is implemented and progressed. If little voluntary action occurs with the CoP then Greater Wellington could review the conditions in the future when more water quality information was available, and require discharge standards at that point.

Water quality sampling is recommended at the following sites and parameters listed in Table 14 on the following page:

Table 14: Recommended Monitoring Sites and Water Quality Parameters

Monitoring Sites	Water Quality Parameters
• Moroa water race intake • Longwood water race intake • Discharge to Papawai Stream near Papawai Rd • Papawai Stream upstream and downstream of discharge • Discharge to Otakura Stream near Te Mairie Rd • Otakura Stream upstream and downstream of discharge • Discharge to Donalds Creek near Featherston oxidation ponds discharge. • Donalds Creek upstream and downstream of discharge	• E.coli • Total nitrogen • Nitrate nitrogen • Total phosphorus • Dissolved reactive phosphorus • Ammonia • PH • Conductivity • Dissolved oxygen • Suspended solids

In the case of the Moroa water race, the Papawai and Otakura Streams were considered the most sensitive streams in terms of the potential effects of the discharges. The two particular discharges to be sampled are considered the best representative sites. For the Papawai discharge, this water race channel flows through urban Greytown and is approximately 7.5 km from the intake. For the Otakura Stream discharge, this water race channel flows through an reasonable sized intensive farming area (including a number of dairy farms) and is approximately 15 km from the intake. For these discharges it is recommended that monitoring occur on a fortnightly basis between November and April inclusive, which is likely to be the time of year where the greatest effect would be observed due to lower stream flows and higher water use for consumptive and non-consumptive purposes. Unfortunately an upstream and downstream sample of the Papawai discharge cannot be taken as the discharge merges with headwaters of the tributary of the Papawai Stream.

The applicant has proposed to monitor one of the discharges into Dock Creek at S H 53 due to the ease of access. I believe that the monitoring site into the Otakura Stream is more appropriate. This site is less than 100 metres from Te Mairie Rd.

In the case of the Longwood water race, Donalds Creek is the most sensitive receiving water environment. Donalds Creek shows signs of water quality degradation upstream of the discharges. This is primarily due to the input of discharge water from the Featherston oxidation ponds. In my view, as the stream is already degraded any additional inputs of contaminants should be closely monitored. For this discharge, it is recommended that monitoring take place on a monthly basis for the entire year at the same time as monitoring is completed on the Featherston oxidation ponds discharge.

The larger watercourses which receive discharges from the Moroa and Longwood water races (Waiohine River, Tauherenikau River, and Dock Creek) are likely to be less sensitive to discharges from the water race. Although monitoring of all discharges was considered, this was not deemed to be practical, hence focussed monitoring at the above mentioned sites is preferred.

As well as supplying Greater Wellington with water quality monitoring results, the applicant will need to complete an audit of water quality following the first three years of discharge monitoring with the aim of improving water quality at the discharge points. This audit will assess the impact of the discharge at the monitored sites and identify and decide on appropriate mitigation measures to minimise the adverse effects of land use practices on water quality. Also if the discharge is having an adverse effect on the receiving water environment, the applicant will need to investigated alternative methods to treat the discharge such as installing a wetland system in the tail race(s). This is consistent with by 4.2.29 of the RFP which encourage existing lawful users to progressively upgrade their environmental performance.

The Code of Practice (CoP) provides some mechanisms for minimising potential effects of the discharges. Greater Wellington provided some advice as to certain matters that could be included in their CoP, however it appears on face value that this advice has been overlooked. Hence I believe the CoP should be revisited over the next year and the following matters should be reviewed and updated:

- Public awareness and education timetable for promoting the CoP.
- Targetted investigations timetable into sources of water quality degradation.
- Timetable for requiring fencing of water races.

One principle difficulty with the CoP is that it is voluntary which makes it potentially difficult to deal problems that may arise. The commitment to implement the CoP then solely depends on the will of the SWDC. An important link to this is the Moroa and Longwood water race by-laws which have to be reviewed as part of changes to the Local Government Act. It is recommended that SWDC complete appropriate changes to the by-laws once the review of the CoP has been completed.

With the above proposed consent conditions, I believe that the relevant provisions of the RMA relating to discharge permits (particularly sections 105(1), section 104(3), and section 107) have been appropriately considered. Furthermore the discharge and mitigation measures proposed as consent conditions ensure that policies 5.2.3, 5.2.4, and 5.2.6 of the RFP are satisfied.

7.2.3 Land use consents

The effects of maintenance works in the bed of the Tauherenikau and Waiohine Rivers are considered to be minor. A number of consent conditions avoid, remedy, or mitigate any potential adverse effects of these activities. These conditions include:

- Limiting the scale of maintenance works to what is reasonably necessary to allow water to be diverted into the intake.
- Ensuring the main alignment of the active flowing channel is not altered.
- Ensuring that fish passage is not hindered as a result of the works.
- Taking all practical steps to release suspended sediment including any channel crossings being limited to one path only.
- Public access to the river bed should not be restricted.
- The timing of works is not permitted during normal recreational times i.e. after 5 p.m, weekends, and public holidays.
- All equipment and materials are removed from the river bed.
- The risk of contaminants entering water is minimised.
- Ensuring that any erosion as a result of the maintenance works is repaired.
- That all steps are taken to avoid disturbance to nesting birds.

In terms of the structures located in the river bed, as there are no adverse effects with the intake to the Moroa water race, no consent conditions are necessary. However in the case of the Longwood water race the structure in the bed of the Tauherenikau River has the potential to effect fish passage. As a result the applicant is required to investigate and implement appropriate measures to mitigate any potential effects within 2 years of the consent becoming operative. This is to be done in consultation with the Wellington Fish & Game Council and the Department of Conservation.

8.0 Other Matters

8.1 Consideration of submissions

As discussed in section 3.2 and 3.3 a number of submissions have been made on these resource consent applications. The majority of submissions support the applications made, hence in many ways those submissions have been appropriately considered through the recommendation to grant the applications for a 20 year term (Moroa water race) and 15 year term (Longwood water race).

One landowner opposed the resource consent applications for the Moroa water race. They key concerns related to the maintenance and costs of the water race. They would like landowners to opt out of the water race scheme if there was a practical way to do so such as diverting the water race around other properties. These points cannot really be taken into consideration as the applications relate to the effects of taking and discharging water. SWDC has the sole responsibility for charging, maintenance, and location of the water race network. No landowners opposed the resource consent applications for the Longwood water race.

Rangitaane o Wairarapa, Wellington Fish & Game Council, and Wellington Conservation Board all opposed both resource consent applications for the Moroa and Longwood water races. I have viewed the submissions and believe that the proposed consent conditions addressed the primary concerns of water efficiency, potential effects of taking water during low river flows, water quality in the water race network and the associated effects of the discharges, works in the river bed, and the consent term.

Choice Health neither supported or opposed the resource consent applications. There is a proposed consent condition resolves their concerns about contamination of the water race. They specified that a condition be included that advised people that water was unsuitable for human consumption. I would recommend that this matter be referred to as a matter for when the CoP is reviewed.

The **Department of Conservation** gave conditional support to the application. They requested that the CoP be amended to require any eels or fish to be returned to the race system following cleaning. This has been done. Other proposed consent conditions ensure that stepdown allocations are made when the rivers fall into low flow, and that the CoP is actively promoted by the applicant.

I am satisfied that through the assessment of the resource consent applications and inclusion of a number of proposed consent conditions, that the submitters concerns have been appropriately considered and addressed. As discussed earlier all submitters who requested to be heard have withdrawn their right to be heard at a hearing subject to the proposed consent conditions being included as part of the conditions of any consents granted.

8.2 Mapping and Location of the Moroa and Longwood Water Races

Maps of the Moroa and Longwood water races were submitted with AEE report. There are a number of inaccuracies with the current maps available of the water race networks. The AEE report identified that both water races do not appear to significantly interact with other watercourses within the bounds of the water race networks.

In the case of the **Longwood water race**, the following resources are available to assess the exact location of the water race network:

- Featherston County Council Water Race Cleaning Map 1980.

- Featherston-Longwood Water Race District Map from Water Resources Management Plan for the Tauherenikau Water Resource Region 1984.
- Longwood Race AEE report map 2001
- GIS coverage of Longwood water race held on GW Arcview coverage

I am satisfied that the Longwood water race does not interact with permanently flowing streams. The water race collects stormwater runoff during winter and high rainfall events. Nevertheless there are a number irregularities between all these map resources. If consents were granted, I would recommend that the SWDC update the current water race network and present an official Longwood water race map to a minimum scale of 1:10, to the satisfaction of Greater Wellington within 12 months of any consents being granted.

In the case of the **Moroa water race**, the following resources are available to assess the exact location of the water race network:

- Featherston County Council Moroa Water Race District Map 1976.
- Moroa Race AEE report map 2001
- GIS coverage of Moroa water race held on GW Arcview coverage

It does not appear that the Moroa interacts with permanently flowing streams. The water race collects stormwater runoff during winter and high rainfall events. Nevertheless there are a number irregularities between all these map resources. In particular there are some areas of the more recent map coverages of the Moroa water which define some natural or artificially modified watercourses as water races. For example the Battersea Drain on the AEE report map and the current GIS coverage is defined as part of the Moroa water race. Historically the Battersea Drainage District has been considered a series of artificially modified watercourses. If consents were granted, I would recommend that the SWDC update the current water race network and present an official Moroa water race map to a minimum scale of 1:10, to the satisfaction of Greater Wellington within 12 months of any consents being granted.

8.3 Review Conditions

Stringent review conditions are proposed. This is seen as vital given that a number of investigations and monitoring is required to be completed throughout the term of the consent.

The review can be enacted by Greater Wellington at any of the following times:

- Within three months of the fifth, tenth, and/or fifteenth (Moroa only) anniversaries of the grant date of the consents.
- Within three months of any changes to the RFP.
- Within three months of any of the reviews/audits been completed.

8.4 Users Forum

Policy 6.2.9 of the RFP encourages the role of "user committees" to assist in the managing the taking and use of fresh water. I consider that such a committee would be of value to both water race systems. At present there is a committee that meets regularly to discuss matters relating to the Moroa water race and holds an annual general meeting. There is no such committee for the Longwood water race. A proposed consent condition requires the applicant to hold an annual forum for all water race users on the Longwood water race. This will be an appropriate forum to discuss the implementation of the management and operation plans.

9. Concluding Remarks

The AEE report submitted with the resource consent applications provided some helpful assessment of the potential effects on the environment in some areas. There were many areas though where the information provided was sub-standard when considering the nature and scale of the water races. Nevertheless the deficiencies in these areas, have been overcome through the setting of appropriate consent conditions.

10.0 Moroa Water Race – Proposed Consent Conditions

General conditions for WAR 010200

Consent term

1. In terms of section 123(c) of the Resource Management Act 1991, the period for which these consents are granted is limited to 20 years from date of commencement of these consents.

Works to be undertaken in accordance with consent application

2. The location, design, implementation and operation of the works shall be accordance with resource consent application WAR 010200 and associated plans and documents lodged with the Wellington Regional Council on 29 June 2001 including `Assessment of Environmental Effects' (AEE) report dated 20 June 2003 and modified 12 September 2003, but subject to any modifications required to comply with any of the conditions of consent.

Change to consent conditions

3. The consent holder may apply, at any time, for the change or cancellation of any consent condition, other than Condition 1 relating to the duration of these consents.

Review of conditions

4. The Wellington Regional Council may review any or all conditions of these consents other than the condition relating to the consent duration by giving notice of its intention to do so pursuant to section 128 of the Resource Management Act 1991 at any of the following times:

    - Within three months of the fifth, tenth, and fifteenth anniversaries of the grant date of these consents;
    - Within three months of any changes to the Regional Freshwater Plan becoming operative;
    - Within three months of the Water Use Review report (as required under Conditions 17-19 being submitted;
    - Within three months of the Water Quality Audit report (as required under Conditions 45 and 46) being submitted.

5. The review of consent conditions as provided for in Condition 4 shall be for any of the following purposes:

    - To reassess the abstraction rates, restriction levels and minimum flows (including irrigation abstractions from the water race) to provide for consistency with the Regional Freshwater Plan;
    - To alter the rate of abstraction to correspond to the actual rate of water usage based on flow monitoring information and/or outcomes of the Water Use Review ;
    - To reassess monitoring requirements associated with this consent;
    - To deal with any significant adverse effects on the environment which may arise as a result of this consent;
    - To deal with any other matters relevant to the authorised activity that may be raised through the review.

6. The Wellington Regional Council shall be entitled to recover from the consent holder the costs of the conduct of any review, calculated in accordance with and limited to that Council's scale

of charges in force and applicable at that time pursuant to Section 36 of the Resource Management Act 1991.

Resource Management Charges

7. A resource management charge, set in accordance with Section 36(2) of the Resource Management Act 1991, shall be paid to the Wellington Regional Council for the carrying out of its functions in relation to the administration, monitoring, and supervision of resource consents and for the carrying out of its functions under Section 35 (duty to gather information, monitor, and keep records) of the Act.

Code of Practice

8. The consent holder shall implement the Code of Practice submitted with the AEE report and shall report the following matters to the Manger, Planning & Resources, Wellington Regional Council on an annual basis prior to 30th September each year for the term of this consent:

    - Summary of landowner checklists completed and follow up undertaken.
    - Any educational measures undertaken to implement the Code of Practice.

9. The consent holder shall review the Code of Practice within 12 months of the consent becoming operative and shall incorporate the following matters as part of the review:

    - Public awareness and education timetable for promoting Code of Practice.
    - Targeted investigations timetable into sources of water quality degradation.
    - Timetable for requiring restrictions on stock access to water races.
    - Procedures to advise landowners that water is unfit for human consumption without prior treatment.
    - The revised Code of Practice shall be submitted to satisfaction of the Manager, Planning & Resources, Wellington Regional Council within 16 months of the consent becoming operative.

Mapping of water race networks

10. The consent holder shall submit updated maps of the Moroa and Longwood water race networks to the satisfaction of the Manager, Planning & Resources, Wellington Regional Council, within 12 months of the consent becoming operative.

Conditions for WAR 010200 (21378) – Water permit to take and use surface water

Maximum abstraction rate

11. The taking of water for the Moroa water race from the Waiohine River via the diversion channel at or about map reference NZMS 260 S26: 2711602 – 6013744 (Point B on the attached Plan 1) shall not exceed the following rates of take:

    - 500 litres/second when the flow in the Waiohine River at the Gorge monitoring site is at or above 4000 litres/second;
    - 450 litres/second when the flow in the Waiohine River at the Gorge monitoring is less than 4000 litres/second but greater than 3040 litres/second;
    - 400 litres/second when the flow in the Waiohine River at the Gorge monitoring is less than 3040 litres/second but greater than 2300 litres/second;
    - 350 litres/second when the flow in the Waiohine River at the Gorge monitoring is less than 2300 litres/second.

Note: 1. No abstraction from any other watercourses is authorised by this consent.
2. If there is a serious temporary shortage of water the Wellington Regional Council may issue a water shortage direction under section 329 of the Resource Management Act 1991. This direction may restrict or suspend the taking or use of water for a period of up to 14 days. Such directions may be renewed after that time.

12. The combined abstraction from the Waiohine River for the Moroa water race and Greytown-Featherston public water supply via the diversion channel shall not exceed 500 litres/sec, when the flow in the Waiohine River at the Gorge monitoring site is less than 3040 litres/second.

Water quantity monitoring

13. The consent holder shall install a water flow monitoring site (pre-cast flume) to monitor the abstraction rate in the Moroa water race with a measurement error of no more than +/- 10%. The water flow monitoring site shall be located between the water race intake control structure (Point B on Plan 1) and Wairarapa railway line, and upstream of any water race branches. The flow monitoring site shall be installed within 6 months of the consent becoming operative to the satisfaction of the Manager, Planning & Resources, Wellington Regional Council.

14. In accordance with Condition 13, the following construction and monitoring standards shall be adhered to:

    - The flow monitoring site shall be constructed to published dimension tolerances for the type of device and shall be capable of measuring abstraction rates in the range of 200-600 litres/sec. As built measurements are to be taken to confirm the construction accuracy.
    - The flow monitoring site shall be installed to ensure that any potential scour of the banks of the water race channel is minimised and that the site does not significantly change the bed level of the water race channel.
    - Following construction, the flow monitoring site shall be appropriately rated through a series of gaugings (to an error not exceeding +/- 10%) at various abstraction rates.
    - An inspection of the flow monitoring site shall be regularly carried out to ensure that there are no blockages or bed level changes in the water race channel (at least 50 metres downstream of the flow monitoring site) that will affect the measurement of abstraction rates. If significant permanent changes are observed during any inspection, the flow monitoring site shall be re-rated.

15. The abstraction rates measured by the device described in Condition 13 shall be recorded by electronic means, at not greater than fifteen minute intervals, in a tamper-proof recording device such as a data-logger. The recorded data shall not be changed or deleted by any person, until after twelve months have passed since the date of recording.

16. The consent holder shall provide the following information to the Consents & Compliance Section, Wellington Regional Council on a quarterly basis no later than 1 month after 31st March, 30th June, 30th September, and 31st December each year for the term of this consent:

    - Maximum for each day abstraction rate (in litres/second)
    - Average for each day abstraction rate (in litres/second)
    - Minimum for each day abstraction rate (in litres/second)

Water Use Review

17. The consent holder shall undertake a review of the use and efficiency of the Moroa water race. The review shall:

    - Identify any measures that can be implemented in the management of the Moroa water race and any physical improvements that can be made to the Moroa water race to minimise the loss of water and to improve efficiency of water use;
    - Identify the level of use of and dependency on the Moroa water race for domestic and stock water, through the completion of a field survey of all properties served by the race and an assessment of the proportion of properties served by the race where there are no alternative water sources available;
    - Identify any sections of the Moroa water race which are redundant and could be closed as a result of the investigations.

18. The field survey required under Condition 18 shall include the following for each property serviced by the Moroa water race:

    - A calculation of the land area for which the Moroa water race provides the only source of water for stock or domestic purposes;
    - Identification of the land use of properties which are served by the Moroa water race;
    - For properties where stock grazing occurs, an assessment of water usage based on the stock holding capacity of the land served by the Moroa water race; and
    - An assessment of whether there are any alternative water sources available for each property (e.g. bore water).

19. The consent holder shall provide the Consents and Compliance Section, Wellington Regional Council, with a full report of the investigations required under Conditions 17 and 18 of this consent. This report shall include a timetabled programme of any measures the consent holder has committed to implement as a result of the review. The report shall be submitted within 4 years of the consent becoming operative.

Use of the water in the water race

20. Water shall only be abstracted from the Moroa water race for domestic and stock water purposes, except for the irrigation activities described in the application for this consent and supporting `Assessment of Environmental Effects' (AEE) report.

Note: Any water use not described in the AEE report will require a change of consent conditions, as described in Condition 3.

21. Any irrigation from tail-races entering the Dock Creek and Otakura Stream catchments shall comply with and rostering/restrictions as directed by the Manager, Planning & Resources, Wellington Regional Council.

    Note: The minimum flow at present for Dock Creek is 500 litres/sec at Walls property, whilst the minimum flow for the Otakura Stream is 150 litres/sec at the Council's automated flow monitoring site.

22. There shall not be any overland flow of water out of any water race channel (i.e. water spilling out of the race onto adjacent land) except when there is high flow in the race due to high river flows and/or stormwater runoff into the race.

Conditions for WAR 010200 (21379) – Water permit to divert water

Note: For the purpose of this consent, the diversion of water is defined as any water diverted from the active flowing channel of the Waiohine River at or about NZMS 260 S26: 11458 - 14133 (Point A on Plan 1). This includes the water that is ultimately taken for the Moroa water race at Point B on Plan 1.

23. The rate at which water is diverted from the Waiohine River for the Moroa water race shall not equate to more than 30% of the flow of the Waiohine River at the point of diversion (Point A on attached Plan 1) at all times.

24. The consent holder shall take all practical steps to minimise the amount of water diverted particularly during times of low flow.

Conditions for WAR 010200 (21587) – Land use consent for work in the river bed

25. The disturbance of the bed of the Waiohine River under this consent shall be limited to activities to maintain or repair the inlet structure on the true right bank of the Waiohine River at or about NZMS 260 S26: 11458 - 14133, the clearance of gravel away from that inlet structure, and the construction of a channel from the active flowing channel in the Waiohine River to the inlet structure.

26. The alignment of the main flow of the Waiohine River shall not alter as a result of works authorised by this consent.

27. The consent holder shall ensure that fish passage in the Waiohine River is not hindered due to any works in the river authorised by this consent.

28. All practical steps shall be undertaken to minimise the release of suspended sediment into the active flowing channel during any works in the river authorised by this consent.

29. Any crossing of the active flowing channel for the purposes of carrying out works described in Condition 25 shall be kept to an absolute practical minimum and to only one path.

30. Public access to the riverbed shall not be restricted for a period greater than necessary to complete each set of works.

31. The consent holder shall not undertake any maintenance works in the Waiohine River under this consent during public holidays, weekends, or after 5 p.m. in the evening unless the works are essential and unavoidable. In such a case the consent holder shall notify the Manager, Planning & Resources, Wellington Regional Council, prior to commencing the works.

32. All equipment and surplus materials used for any of the maintenance activities shall be removed from the riverbed upon completion of those activities.

33. The consent holder shall minimise the risk of contaminants (including, but not limited to oil, petrol, diesel, hydraulic fluid) entering water by ensuring that:

    - No fuel or lubricants are stored within the riverbed;
    - There is no refuelling, cleaning or storing of machinery in the riverbed;
    - All machinery is well maintained at all times to prevent leakage of oil or fuel or the spill of other chemicals into the river;
    - In the event of a spill of fuel, hydraulic fluid or other liquid contaminants, immediate steps are taken to contain the spilled material. The Manager, Planning & Resources, Wellington Regional Council shall be informed immediately of any such spill.

34. The consent holder shall ensure that any erosion of the river bank and damage to access tracks and/or river protection works, that is a direct result of works authorised by this consent, shall be repaired as soon as practicable.

35. The consent holder shall take all reasonable steps to avoid disturbance to nesting birds (including but not limited to banded dotterels, black-fronted dotterels, black-billed gulls, pied stilts, and variable oystercatchers) when undertaking works authorised by this consent during the months of September to December.

Conditions for WAR 010200 (21586) – Discharge permit to discharge residual water into the Waiohine River, Papawai Stream, Otakura Stream, and Dock Creek

36. The consent holder shall ensure that the discharge of water from the Moroa water race does not cause scour of the banks or river and stream beds at any of the discharge locations.

Receiving water quality

37. After reasonable mixing the discharge of water from the Moroa water race into natural watercourses shall not cause any of the following effects:

    - The production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
    - Any conspicuous change in the colour or visual clarity;
    - Any emission or objectionable odour;
    - The rendering of freshwater unsuitable for consumption by farm animals;
    - Any significant adverse effects on aquatic life;
    - Undesirable biological growths;
    - The temperature to be changed by more than 3°C or to exceed 25°C.

Note: For the purpose of this consent, reasonable mixing is defined as:

- *30 metres downstream of the lower end of the first riffle downstream of the discharge outlet of the water race to the active flowing channel in the Waiohine and Tauherenikau Rivers.*
- *30 metres downstream of the discharge outlet of the water race to the active flowing channel of all other watercourses, except the monitored discharge to the Otakura Stream.).*
- *In the case of the monitored discharge to the Otakura Stream, the reasonable mixing zone will be defined by written agreement between Wellington Regional Council and South Wairarapa District Council within 6 months of the consent becoming operative.*

Water quality monitoring

38. The consent holder shall monitor the water quality of the Moroa water race and receiving water environment at the following locations:

    - Diversion channel off Waiohine River immediately upstream of the intake to the Greytown-Featherston public water supply, at or about map reference NZMS 260 S26: 2711441 - 6014028, Point A on attached Plan 1)
    - Discharge to tributary of Papawai Stream, at or about map reference NZMS 260 T26: 3264-2813, Point A on attached Plan 2)
    - Discharge to Otakura Stream, at or about map reference NZMS 260 S27: 2711307 - 6000429, Point A on attached Plan 3).
    - Upstream of discharge to Otakura Stream, at or about map reference NZMS 260 S27: 2711307 - 6000429, Point B on attached Plan 3)
    - Downstream of discharge to Otakura Stream, at or about map reference NZMS 260 S27: 2711307 - 6000429, Point C on attached Plan 3)

39. Samples shall be taken on a fortnightly basis between November and April each year for the term of the consent. Samples shall be analysed for the following parameters:

    - *E.coli;*
    - Total nitrogen;
    - Total phosphorus;
    - pH;
    - Conductivity;
    - Dissolved oxygen; and
    - Suspended solids.

40. The sampling and analysis of total nitrogen, total phosphorus, and suspended solids shall be undertaken using laboratory techniques and field techniques for the first year of sampling. If a clear relationship/correlation is established between laboratory techniques and field techniques for measuring the above parameters, then sampling techniques will be reviewed after the first year of sampling. Monitoring of total nitrogen, total phosphorus, and suspended solids (or turbidity) using field techniques only, can only commence once written agreement is reached between the consent holder and the Wellington Regional Council after the review. If no written agreement is reached, laboratory techniques shall continue after the first year of sampling.

41. The water quality sampling and analysis required under Conditions 38 and 39 shall be performed by a suitably qualified person.

42. The results of the water quality monitoring required under Conditions 38 and 39 shall be submitted to the Consents and Compliance Section, Wellington Regional Council by 31 May each year for the term of this consent.

43. The consent holder shall notify the Wellington Regional Council, Consents & Compliance Section at least 48 hours before the commencement of any water quality monitoring, so that the reasonable mixing zone for the monitored discharge to the Otakura Stream can be appropriately determined.

44. Following the completion of the Water Quality Audit (see conditions 45 and 46) the water quality monitoring programme will be reviewed if the water quality monitoring programme shows that the discharge is having a minor effect on the environment. As a result of the review, the water quality monitoring programme may be altered by written agreement between the consent holder and the Wellington Regional Council. The water quality monitoring programme will remain in place until such time that either written agreement has been reached or consent conditions have been changed.

    Note: If agreement cannot be reached on the water quality monitoring during such a review, either a formal review of the consent will be made (in accordance with condition 4 and section 128 of the Resource Management Act 1991) or alternatively the consent holder can apply for a change of consent conditions (under section 127 of the Resource Management Act 1991).

Water Quality Audit

45. The consent holder shall undertake a Water Quality Audit of the Moroa water race. The audit shall:

    - Assess the impact of the discharge on the Papawai Stream and Otakura Stream based on water quality monitoring results collected; and
    - Identify and decide on appropriate mitigation measures to minimise adverse effects of land use practices on the quality of water in the races, including ways in which total nitrogen and total phosphorus concentrations and bacteriological contamination in the water race discharge can be decreased.

46. The consent holder shall provide the Consents and Compliance Section, Wellington Regional Council, with a full report of the Water Quality Audit required under Condition 45 of this consent. This report shall include a timetabled programme of measures the consent holder has committed to implement as a result of the audit. The report shall be submitted within 3 years of the consent becoming operative.

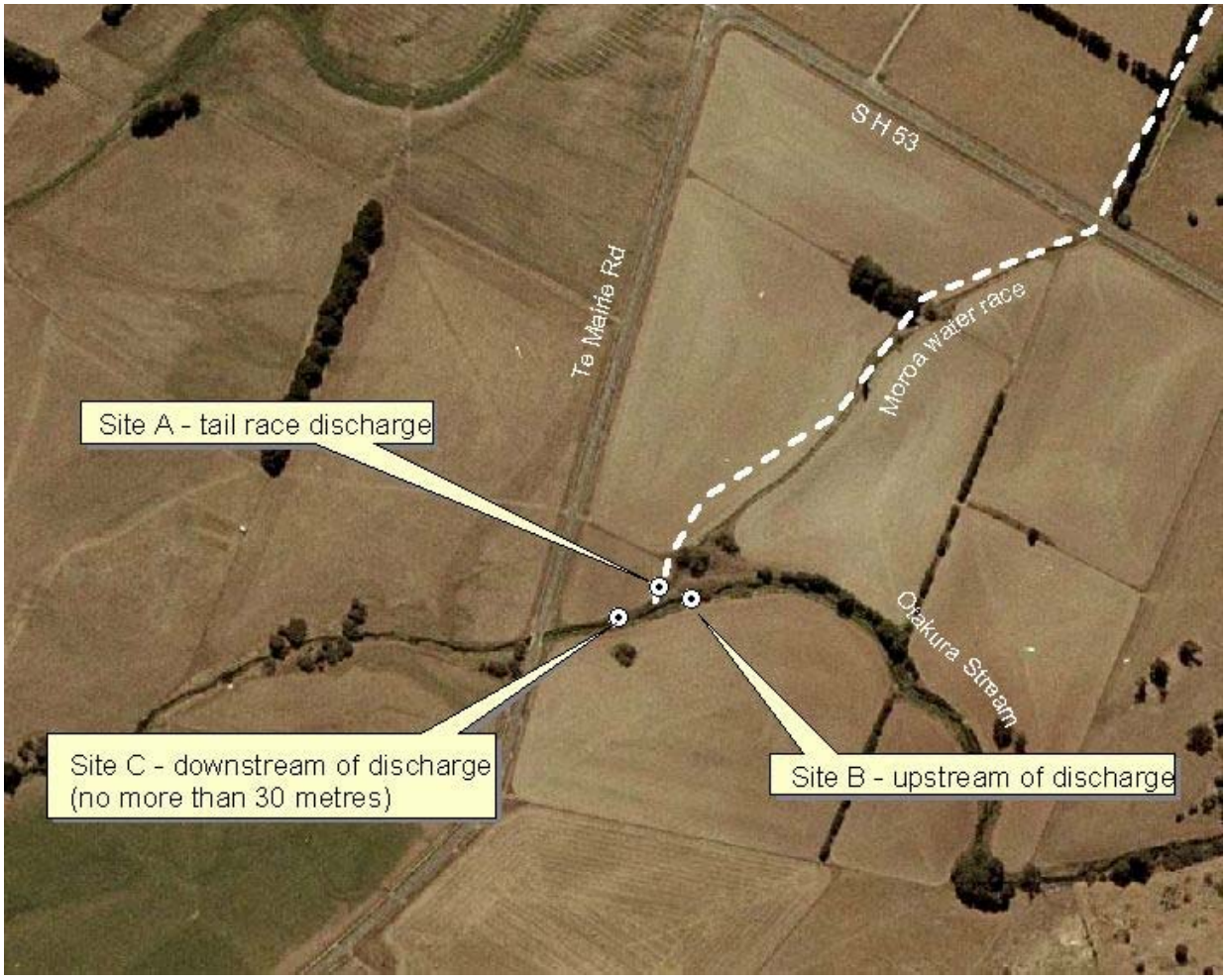
Plan 1


Greytown-Featherston
public water supply
treatment ponds
Point A - Diversion intake
from Waiohine River
Waiohine Valley Rd
Point C - Intake water
quality monitoring site
Point B - Intake control structure

Plan 2


Point A - Discharge water
quality monitoring site
Papawai Rd

Plan 3


S H 53
Te Maire Rd
Moroa water race
Site A - tail race discharge
Otakura Stream
Site C - downstream of discharge
(no more than 30 metres)
Site B - upstream of discharge

11.0 Longwood Water Race – Proposed Consent Conditions

General conditions for WAR 010200

Consent term

1. In terms of section 123(c) of the Resource Management Act 1991, the period for which these consents are granted is limited to 15 years from date of commencement of these consents.

Works to be undertaken in accordance with consent application

2. The location, design, implementation and operation of the works shall be accordance with resource consent application WAR 010201 and associated plans and documents lodged with the Wellington Regional Council on 29 June 2001 including `Assessment of Environmental Effects' (AEE) report dated 20 June 2003 and modified 12 September 2003, but subject to any modifications required to comply with any of the conditions of consent.

Change to consent conditions

3. The consent holder may apply, at any time, for the change or cancellation of any consent condition, other than Condition 1 relating to the duration of these consents.

Review of conditions

4. The Wellington Regional Council may review any or all conditions of these consents other than the condition relating to the consent duration by giving notice of its intention to do so pursuant to section 128 of the Resource Management Act 1991 at any of the following times:

    - Within three months of the fifth, and tenth anniversaries of the grant date of these consents;
    - Within three months of any changes to the Regional Freshwater Plan becoming operative;
    - Within three months of the Water Use Review report (as required under Conditions 17-19) being submitted;
    - Within three months of the Water Quality Audit report (as required under Conditions 46 and 47) being submitted.

5. The review of consent conditions as provided for in Condition 4 shall be for any of the following purposes:

    - To reassess the abstraction rates, restriction levels and minimum flows (including irrigation abstractions from the water race) to provide for consistency with the Regional Freshwater Plan;
    - To alter the rate of abstraction to correspond to the actual rate of water usage based on flow monitoring information and/or outcomes of the Water Use Review ;
    - To reassess monitoring requirements associated with this consent;
    - To deal with any significant adverse effects on the environment which may arise as a result of this consent;
    - To deal with any other matters relevant to the authorised activity that may be raised through the review.

6. The Wellington Regional Council shall be entitled to recover from the consent holder the costs of the conduct of any review, calculated in accordance with and limited to that Council's scale of charges in force and applicable at that time pursuant to Section 36 of the Resource Management Act 1991.

Resource Management Charges

7. A resource management charge, set in accordance with Section 36(2) of the Resource Management Act 1991, shall be paid to the Wellington Regional Council for the carrying out of its functions in relation to the administration, monitoring, and supervision of resource consents and for the carrying out of its functions under Section 35 (duty to gather information, monitor, and keep records) of the Act.

Code of Practice

8. The consent holder shall implement the Code of Practice submitted with the AEE report and shall report the following matters to the Manger, Planning & Resources, Wellington Regional Council on an annual basis prior to 30th September each year for the term of this consent:

- Summary of landowner checklists completed and follow up undertaken.
- Any educational measures undertaken to implement the Code of Practice.

9. The consent holder shall review the Code of Practice within 12 months of the consent becoming operative and shall incorporate the following matters as part of the review:

- Public awareness and education timetable for promoting Code of Practice.
- Targeted investigations timetable into sources of water quality degradation.
- Timetable for requiring restrictions on stock access to water races.
- Procedures for advise landowners that water is unfit for human consumption without prior treatment.
- The revised Code of Practice shall be submitted to satisfaction of the Manager, Planning & Resources, Wellington Regional Council within 16 months of the consent becoming operative.

User Forum

10. The consent holder shall hold water race users forum on an annual basis to discuss implementation of the Code of Practice identified in Condition 8. Any outcomes of the water race users forum and any associated changes to the Code of Practice shall be forwarded to the Consents & Compliance Section, Wellington Regional Council, within 1 month of the forum.

Mapping of water race networks

11. The consent holder shall submit updated maps of the Longwood water race network to the satisfaction of the Manager, Planning & Resources, Wellington Regional Council, within 12 months of the consent becoming operative.

Conditions for WAR 010201 (21377) – Water permit to take and use surface water

Maximum abstraction rate

12. The taking of water for the Longwood water race from the Tauherenikau River via the diversion channel at or about map reference NZMS 260 S26: 2708272 – 6011417 (Point B on the attached Plan 1) shall not exceed the following rates of take:

- 250 litres/second when the flow in the Tauherenikau River at the Gorge monitoring site is at or above 2000 litres/second;
- 180 litres/second when the flow in the Tauherenikau River at the Gorge monitoring is less than 2000 litres/second but greater than 1350 litres/second;
- 100 litres/second when the flow in the Tauherenikau River at the Gorge monitoring is less than 1350 litres/second.

Note: 1. No abstraction from any other watercourses is authorised by this consent.
2. If there is a serious temporary shortage of water the Wellington Regional Council may issue a water shortage direction under section 329 of the Resource Management Act 1991. This direction may restrict or suspend the taking or use of water for a period of up to 14 days. Such directions may be renewed after that time.

Water quantity monitoring

13. The consent holder shall install a water flow monitoring site (pre-cast flume) to monitor the abstraction rate in the Longwood water race with a measurement error of no more than +/- 10%. The water flow monitoring site shall be located between the water race intake control structure (Point B on Plan 1) and Underhill Rd, and upstream of any water race branches. The flow monitoring site shall be installed within 6 months of the consent becoming operative to the satisfaction of the Manager, Planning & Resources, Wellington Regional Council.

14. In accordance with Condition 13, the following construction and monitoring standards shall be adhered to:

- The flow monitoring site shall be constructed to published dimension tolerances for the type of device and shall be capable of measuring abstraction rates in the range of 100-400 litres/sec. As built measurements are to be taken to confirm the construction accuracy.
- The flow monitoring site shall be installed to ensure that any potential scour of the banks of the water race channel is minimised and that the site does not significantly change the bed level of the water race channel.
- Following construction, the flow monitoring site shall be appropriately rated through a series of gaugings (to an error not exceeding +/- 10%) at various abstraction rates.
- An inspection of the flow monitoring site shall be regularly carried out to ensure that there are no blockages or bed level changes in the water race channel (at least 50 metres downstream of the flow monitoring site) that will affect the measurement of abstraction rates. If significant permanent changes are observed during any inspection, the flow monitoring site shall be re-rated.

15. The abstraction rates measured by the device described in Condition 13 shall be recorded by electronic means, at not greater than fifteen minute intervals, in a tamper-proof recording device such as a data-logger. The recorded data shall not be changed or deleted by any person, until after twelve months have passed since the date of recording.

16. The consent holder shall provide the following information to the Consents & Compliance Section, Wellington Regional Council on a quarterly basis no later than 1 month after 31st March, 30th June, 30th September, and 31st December each year for the term of this consent:

- Maximum daily abstraction rate (in litres/second)
- Average daily abstraction rate (in litres/second)
- Minimum daily abstraction rate (in litres/second)

Water Use Review

17. The consent holder shall undertake a review of the use and efficiency of the Longwood water race. The review shall:

- Identify any measures that can be implemented in the management of the Longwood water race and any physical improvements that can be made to the Longwood water race to minimise the loss of water and to improve efficiency of water use;
- Identify the level of use of and dependency on the Longwood water race for domestic and stock water, through the completion of a field survey of all properties served by the race and an assessment of the proportion of properties served by the race where there are no alternative water sources available;
- Identify any sections of the Longwood water race which are redundant and could be closed as a result of the investigations.

18. The field survey required under Condition 17 shall include the following for each property serviced by the Longwood water race:

- A calculation of the land area for which the Longwood water race provides the only source of water for stock or domestic purposes;
- Identification of the land use of properties which are served by the Longwood water race;
- For properties where stock grazing occurs, an assessment of water usage based on the stock holding capacity of the land served by the Longwood water race; and
- An assessment of whether there are any alternative water sources available for each property (e.g. bore water).

19. The consent holder shall provide the Consents and Compliance Section, Wellington Regional Council, with a full report of the investigations required under Conditions 17 and 18 of this consent. This report shall include a timetabled programme of any measures the consent holder has committed to implement as a result of the review. The report shall be submitted within 4 years of the consent becoming operative.

Use of the water in the water race

20. Water shall only be abstracted from the Longwood water race for domestic and stock water purposes.

Note: Any water use not described in the AEE report will require a change of consent conditions, as described in Condition 3.

21. There shall not be any overland flow of water out of any water race channel (i.e. water spilling out of the race onto adjacent land) except when there is high flow in the race due to high river flows and/or stormwater runoff into the race.

Conditions for WAR 010201 (21593) – Water permit to divert water

Note: For the purpose of this consent, the diversion of water is defined as any water diverted from the active flowing channel of the Tauherenikau River at or about NZMS 260 S26: 2708516 - 6011854 (Point A on Plan 1). This includes the water that is ultimately taken for the Longwood water race at Point B on Plan 1.

22. The rate at which water is diverted from the Tauherenikau River for the Longwood water race shall not equate to more than 20% of the flow of the Tauherenikau River at the point of diversion (Point A on attached Plan 1) at all times.

23. The consent holder shall take all practical steps to minimise the amount of water diverted particularly during times of low flow.

Conditions for WAR 010201 (21595) – Land use consent for work in the river bed

24. The disturbance of the bed of the Tauherenikau River under this consent shall be limited to activities to maintain or repair the inlet structure on the true right bank of the Tauherenikau River at or about NZMS 260 S26: 2708516 - 6011854, the clearance of gravel away from that inlet structure, and the maintenance of the weir structure across the bed of the Tauherenikau River.

25. The alignment of the main flow of the Tauherenikau River shall not alter as a result of works authorised by this consent.

26. The consent holder shall ensure that appropriate standard of fish passage in the Tauherenikau River is maintained at all times. The appropriate standard of fish passage in this case must be provided for weak native fish species (inanga, smelt, giant bully, common bully).

27. All practical steps shall be undertaken to minimise the release of suspended sediment into the active flowing channel during any works in the river authorised by this consent.

28. Any crossing of the active flowing channel for the purposes of carrying out works described in Condition 27 shall be kept to an absolute practical minimum and to only one path.

29. Public access to the riverbed shall not be restricted for a period greater than necessary to complete each set of works.

30. The consent holder shall not undertake any maintenance works in the Tauherenikau River under this consent during public holidays, weekends, or after 5 p.m. in the evening unless the works are essential and unavoidable. In such a case the consent holder shall notify the

Manager, Planning & Resources, Wellington Regional Council, prior to commencing the works.

31. All equipment and surplus materials used for any of the maintenance activities shall be removed from the riverbed upon completion of those activities.

32. The consent holder shall minimise the risk of contaminants (including, but not limited to oil, petrol, diesel, hydraulic fluid) entering water by ensuring that:

- No fuel or lubricants are stored within the riverbed;
- There is no refuelling, cleaning or storing of machinery in the riverbed;
- All machinery is well maintained at all times to prevent leakage of oil or fuel or the spill of other chemicals into the river;
- In the event of a spill of fuel, hydraulic fluid or other liquid contaminants, immediate steps are taken to contain the spilled material. The Manager, Planning & Resources, Wellington Regional Council shall be informed immediately of any such spill.

33. The consent holder shall ensure that any erosion of the river bank and damage to access tracks and/or river protection works, that is a direct result of works authorised by this consent, shall be repaired as soon as practicable.

34. The consent holder shall take all reasonable steps to avoid disturbance to nesting birds (including but not limited to banded dotterels, black-fronted dotterels, black-billed gulls, pied stilts, and variable oystercatchers) when undertaking works authorised by this consent during the months of September to December.

35. The consent holder shall investigate and implement appropriate measures to mitigate the potential adverse effects of the weir structure on fish passage within 2 years of the consent becoming operative to ensure that the weir structure provides for an appropriate standard of fish passage. In this case, the standard of fish passage required is to enable weak native fish species (inanga, smelt, giant bully, common bully). Such investigations and implementation of appropriate mitigation measures shall be undertaken in consultation with the Department of Conservation and Wellington Fish & Game Council.

Conditions for WAR 010201 (21594) – Discharge permit to discharge residual water into the Tauherenikau River and Donalds Creek

36. The consent holder shall ensure that the discharge of water from the Longwood water race does not cause scour of the banks or river and stream beds at any of the discharge locations.

Receiving water quality

37. After reasonable mixing the discharge of water from the Longwood water race into natural watercourses shall not cause any of the following effects:

- The production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
- Any conspicuous change in the colour or visual clarity;
- Any emission or objectionable odour;
- The rendering of freshwater unsuitable for consumption by farm animals;
- Any significant adverse effects on aquatic life;

- Undesirable biological growths;
- The temperature to be changed by more than 3°C or to exceed 25°C.

Note: For the purpose of this consent, reasonable mixing is defined as

- *30 metres downstream of the lower end of the first riffle downstream of the discharge outlet of the water race to the active flowing channel in the Tauherenikau River.*
- *30 metres downstream of the discharge outlet of the water race to the active flowing channel of all other watercourses, except the monitored discharge to Donalds Creek (see condition 38).*
- *In the case of the monitored discharge to Donalds Creek, the reasonable mixing zone will be defined by written agreement between Wellington Regional Council and South Wairarapa District Council within 6 months of the consent becoming operative.*

Water quality monitoring

38. The consent holder shall monitor the water quality of the Longwood water race and receiving water environment at the following locations:

    - Longwood water race immediately downstream of the intake control structure, at or about map reference NZMS 260 S26: 2708272 - 6011417, Point B on attached Plan 1)
    - Discharge to Donalds Creek, at or about map reference NZMS 260 T26: 3264-2813, Point A on attached Plan 2)
    - Upstream of discharge to Donalds Creek, at or about map reference NZMS 260 S27: 2711307 - 6000429, Point B on attached Plan 2)
    - Downstream of discharge to Donalds Creek, at or about map reference NZMS 260 S27: 2711307 - 6000429, Point C on attached Plan 2)

39. Samples shall be taken on a monthly basis between January and December each year for the term of the consent. Samples shall be taken at the same time as sampling is completing for the Featherston sewage discharge and shall be analysed for the following parameters:

    - *E.coli;*
    - Total nitrogen;
    - Total phosphorus;
    - pH;
    - Conductivity;
    - Dissolved oxygen; and
    - Suspended solids.

40. The sampling and analysis of total nitrogen, total phosphorus, and suspended solids shall be undertaken using laboratory techniques and field techniques for the first year of sampling. If a clear relationship/correlation is established between laboratory techniques and field techniques for measuring the above parameters, then sampling techniques will be reviewed after the first year of sampling. Monitoring of total nitrogen, total phosphorus, and suspended solids (or turbidity) using field techniques only, can only commence once written agreement is reached between the consent holder and the Wellington Regional Council after the review. If no written agreement is reached, laboratory techniques shall continue after the first year of sampling.

41. The water quality sampling and analysis required under Conditions 38 and 39 shall be performed by a suitably qualified person.

42. The results of the water quality monitoring required under Conditions 38 and 39 shall be submitted to the Consents and Compliance Section, Wellington Regional Council by 31 May each year for the term of this consent.

43. The consent holder shall notify the Wellington Regional Council, Consents & Compliance Section at least 48 hours before the commencement of any water quality monitoring, so that the reasonable mixing zone for the monitored discharge to the Donalds Creek can be appropriately determined.

44. Following the completion of the Water Quality Audit (see conditions 46 and 47) the water quality monitoring programme will be reviewed if the water quality monitoring programme shows that the discharge is having a minor effect on the environment. As a result of the review, the water quality monitoring programme may be altered by written agreement between the consent holder and the Wellington Regional Council. The water quality monitoring programme will remain in place until such time that either written agreement has been reached or consent conditions have been changed.

Note: If agreement cannot be reached on the water quality monitoring during such a review, either a formal review of the consent will be made (in accordance with condition 4 and section 128 of the Resource Management Act 1991) or alternatively the consent holder can apply for a change of consent conditions (under section 127 of the Resource Management Act 1991).

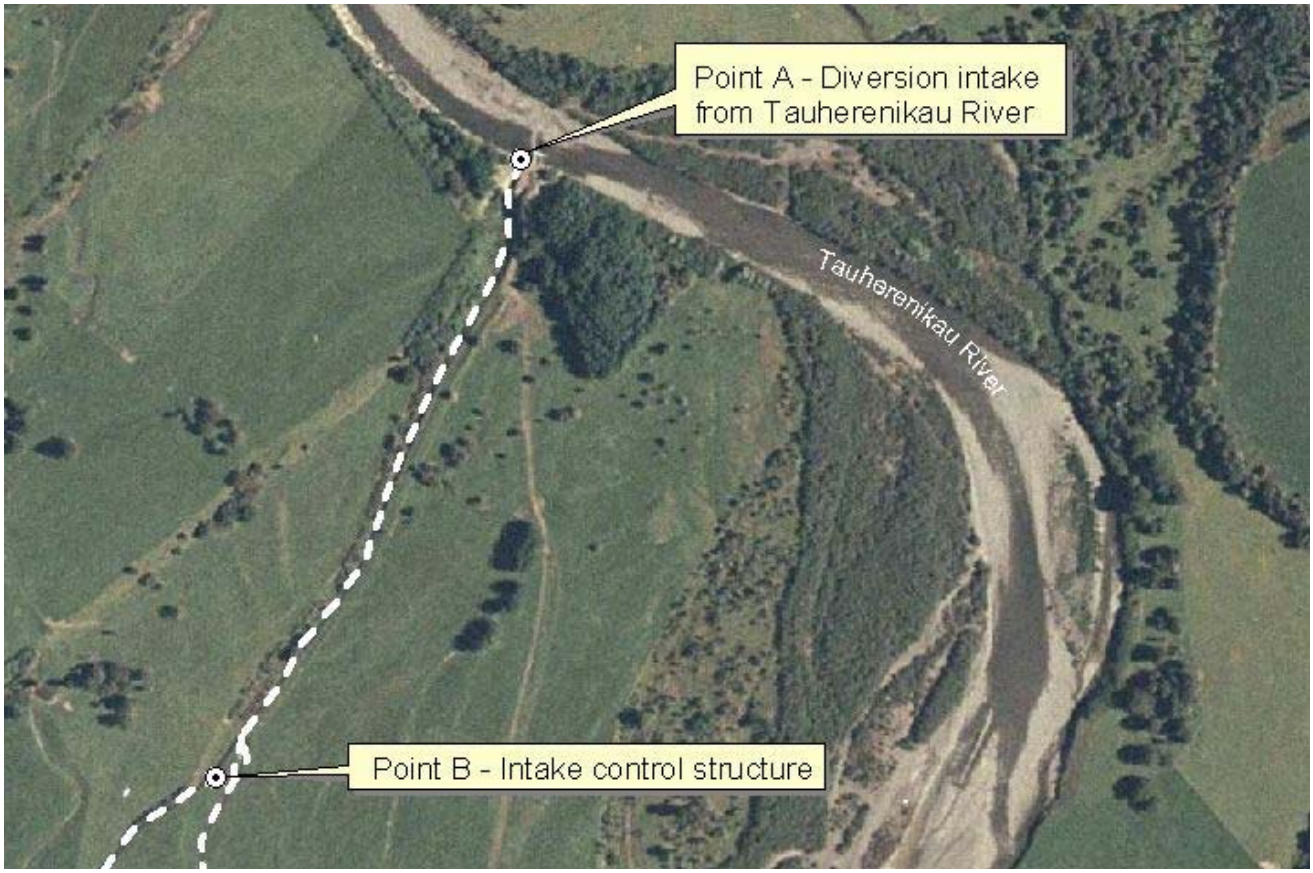
Water Quality Audit

45. The consent holder shall undertake a Water Quality Audit of the Longwood water race. The audit shall:

- Assess the impact of the discharge on the Donalds Creek based on water quality monitoring results collected; and
- Identify and decide on appropriate mitigation measures to minimise adverse effects of land use practices on the quality of water in the races, including ways in which total nitrogen and total phosphorus concentrations and bacteriological contamination in the water race discharge can be decreased.

46. The consent holder shall provide the Consents and Compliance Section, Wellington Regional Council, with a full report of the Water Quality Audit required under Condition 46 of this consent. This report shall include a timetabled programme of measures the consent holder has committed to implement as a result of the audit. The report shall be submitted within 3 years of the consent becoming operative.

Plan 1


Point A - Diversion intake
from Tauherenikau River
Tauherenikau River
Point B - Intake control structure

Plan 2


Featherston
oxidation ponds
Donalds Creek
Point B - Upstream of discharge
Point A - Tail race discharge
Point C - Downstream of discharge
(no more than 30 metres)