STAFF REPORT

TO: Environment & Planning Subcommittee - Commissioner Hearing

FROM: Neil Tyson, Consent Planner

REFERENCE: RM070187

SUBJECT: **TASMAN DISTRICT COUNCIL - REPORT EP10-03-01 -** Report prepared for hearing of 1 to 5 March 2010

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1. APPLICATION AND BACKGROUND

This application was lodged by the Engineering Department of the Tasman District Council (TDC) on 13 March 2007 and publicly notified on 24 March 2007 and some 418 submissions received, many in opposition.

Note: Notification was prior to the (RMA) Amendment Act 2009 and therefore these later RMA provisions do not apply to this application process.

The application RM070187 is for a water permit to take and use up to 20,000 cubic metres of groundwater per day at a maximum instantaneous rate of 310 litres per second (average rate of 231 litres per second) for the purpose of community water supply. The groundwater would be abstracted from the proposed Te Matu Zone within the Central Plains Zone of the Motueka-Riwaka Plains Aquifer. The scheme at full development would use a wellfield consisting of up to nine bores, eight of which would be used and one would be a back-up.

The groundwater is to be used for community supply to supply the townships of Motueka, Riwaka, Tasman Village, Mapua/Ruby Bay, and for rural areas surrounding these townships, including land now zoned Rural 3 under the proposed Tasman Resource Management Plan (TRMP).

When notified, the activity was a *non-complying* activity according to relevant rules in the Proposed Tasman Resource Management Plan (TRMP) that were treated as being operative at the time of application. The main reason for the non-complying status was that the proposed rate of take exceeded the stated allocation limit in the TRMP for the Central Plains Zone.

Since then, the TDC has notified Variation 66 which proposes various changes including a new Te Matu Zone within the Central Plains Zone and an increase in the allocation limit. The proposed changes if they become operative would change the status of the activity to a *controlled* activity. At the time of writing, the period for appeals on the Variation 66 decisions has not yet closed. No appeals have been received to date.

The appeal period closes during the week of 22 February 2010. If no appeals are lodged, then the relevant rules in the TRMP (as amended by Variation 66) are to be treated as being operative in accordance with Section 19(1) of the RMA. If an appeal is lodged on the Variation 66 decisions, then the relevant operative rules will be those in the Motueka Riwaka Plains Water Management Plan (1995). This situation is explained in more detail in Section 2 below.

The investigations by the Council including modelling of the Motueka-Riwaka Plains Aquifer has been extensive and intensive and the results of this work was provided by the applicant in support of the original application.

The data has also been presented to various public forums including as part of the consultation regarding Variation 66. The application has been able to be viewed at all Council offices and the Richmond and Motueka libraries.

1.1 Application Process

The application has been "on hold" at the applicant's request (Section 37 RMA) since the closing date for submissions on 2 May 2007.

Submitter's were advised that in this particular case the Council is both the applicant and also the "*consent authority*" responsible for the processing of the application. As such, a decision was made to contract out the technical assessment and consent processing of the application to Sinclair Knight Merz Limited (SKM), a consultancy company in Christchurch with specialist skills in the area of hydrogeology as well as consent processing. The application would also be heard by independent commissioners.

Subsequent to this, SKM requested under Section 92 RMA further information which was received on 11 May 2007 ie post notification. The further information included an assessment of potential cultural effects of the proposed groundwater abstraction, which was an issue raised by a number of submitters. A report by Mitchell Research on behalf of the applicant was circulated to all submitters and made available on the Council's website.

With regard to this (Section 42A) staff report, at the eleventh hour staff discovered that SKM were unable to provide a full Section 42A report for the hearing. The writer, who is a full time consent planner at TDC was tasked with completing this report. The scope of this report is to cover the background, planning matters, issues relating to submissions and any other relevant matters. SKM continue to provide the independent assessment of the applicant's technical information (Attached as Appendix 1) and will present this at the hearing and be available to answer any technical questions. This report also contains sufficient assessment of technical matters to ensure that all such issues are covered.

While it is acknowledged that it would be preferable for the entire reporting process to have been done by a party that is entirely independent from the Council (SKM) – and this is what was originally planned by consents staff – the writer can declare that he has had no undue contact with the applicant (engineering staff) and no influence has been brought to bare. Therefore, even though the writer is a Council employee I consider this report to be suitably objective and independent, and a reliable resource for the Commissioners in making their decision.

As a result of the short notice to prepare this report there may be some issues which are not entirely developed or covered. Any such matters will need to be addressed by the Commissioners and questions asked of the appropriate presenters at the hearing.

Section 101(2) of the Act specifies that a hearing must be held no later than 25 working days from the closing date for submissions. However the Engineering Services Department requested, pursuant to Section 37A(2)(b) of the Act, that this timeframe be extended as the Department did not wish to have a hearing until after public notification of the plan amendements under Variation 66. The Council, as consent authority, granted this request after taking into account any particular concerns that had been raised.

1.2 Submissions

Of the 419 submissions received to the application, 96 submitters advise that they wish to be heard. 16 submissions were received after the closing date. Most late submissions were received within a few days of the closing date but a few were a month or more.

It appears that the then Resource Consents Manager (Rob Lieffering) considered and accepted (under delegated authority of Section 37 of the Act) the late submissions that were lodged up to 20 working days late. This means that the late submissions up to and including submission number 409 have been accepted. This is also reflected in the Mitchell Research report (page 3).

The remaining late submissions that were received by the Council after the month of May 2007 have not had a decision made and their status will be confirmed prior to the hearing. To accept these "very late" submissions the approval of the applicant must be obtained pursuant to Section 37A(2)(b).

A summary of the submissions is attached.

While a number of the submissions are in support or are neutral, both they and the submissions in opposition raise concerns about many aspects of the proposal. It is not fruitful to try to separate the argument of those for and those against but to simply summarise the main thrusts of the submissions. These are:

- *That water is a taonga and should not be exported or transported away from Motueka where it is required for growth and prosperity. Many of these submitters identify the unsettled claim by iwi to the Waitangi Tribunal and oppose the application until the claim and the question of ownership is resolved.*

- *That Scheme abstraction will have an adverse and unacceptable affect on the reliability of household bores resulting in the need for residents to deepen or drill new bores, install submersible pumps etc; and*

- *Many submitters consider that issues of reticulation to Motueka township must be addressed now and not deferred until 2016 and that lack of water reticulation is hindering Motueka's development.*

- *Many submitters are unconvinced that the applicant's investigations and technical evidence have sufficiently demonstrated that the water is sustainably available and concerned about increased seawater intrusion, increased water rationing including adverse impacts on horticultural production and other water uses.*

- *Many question the logic of transferring Motueka water to water short areas particularly if Motueka is adversely affected.*

- *Submitters in support consider that reticulated supply is needed to achieve good quality supply to households and businesses, and also that water reticulation will provide water for firefighting.*

It is acknowledged that these points may be considered superficial and are only designed to state what has been written on submission forms. The Cultural Impact Assessment compiled by Mitchell Research provides a far more comprehensive assessment of the nature and motives of submissions by Maori. The reader is referred to that document for a thorough summary of Maori submissions. It is also probably fair to say that while the Mitchell Research report was compiled on the basis of Maori submissions, the matters and issues raised arguably provide a good summary of the concerns of many other submitters too.

A range of conditions or conditional issues were raised by submitters. The matters raised were spread across supporting, opposing and neutral submitters and are therefore summarised below without linkage to whether or not support was given. The main conditions sought were:

- That compensation should be provided by the Council to bore owners in the event that they fail and/or free connections should be provided to owners of bores which fail. (Submissions: 41, 47, 75, 80, 89, 118, 120, 121, 127, 140, 149, 150, 154, 159, 161, 169, 171, 177, 184, 193, 194, 195, 198, 201, 202, 023, 257, 258, 268, 292, 297, 382, 383, 384, 3851)

- That the area affected by the potential drawdown should be the first to be reticulated and that Motueka should be reticulated before Coastal Tasman areas and Mapua. (128, 129, 134, 136, 163, 184, 261, 301.)

- That there should be no significant adverse effects on the flow of the Motueka River. (165, 233.)

- That the take must not affect existing community water supplies particularly the Lower Moutere Water Scheme (LMWS) which serves 120 houses (Submission 208). The submission by the **Lower Moutere Water Scheme** (#175) conditionally supported the proposal but seeks changes including an alternative location for the well field. It suggests development of the existing supply sites at the Recreation Centre and Fearons Bush.

- That groundwater levels must be monitored (175).

1 The submission numbers quoted may not be an exhaustive list, but is provided to give an indication of the level of support for the various conditions sought.

2. STATUTORY FRAMEWORK

2.1 Resource Management Act 1991

The application before the Commissioners is for a non-complying activity. The Commissioners may grant or decline an application for a non-complying activity, pursuant to Section 104(B) of the Act and if consent is granted, conditions may be imposed pursuant to Section 108.

A *non-complying* activity may be only be granted if the Commisioners (acting for the consent authority) are satisfied that the effects of the activity on the environment will be minor, or provided the activity is not contrary to the objectives and policies of both the relevant plan and the relevant proposed plan, as per Section 104D of the Act.

In making a decision on an application, the Commisioners are required to first consider the matters set out in Section 104(1) of the Act, in addition to the matters set out in Section 7. Primacy is given to Part II of the Act, "the purpose and principles of sustainable management of natural and physical resources."

Any decision should therefore be based, subject to Part II of the Act, on:

- The actual and potential effects on the environment of allowing the activity;
- Any relevant provisions of national or regional policy statements;
- Relevant objectives, policies, rules or other provisions of a plan or proposed plan; and

Any other matters the Commissioners consider relevant and reasonably necessary to determine the application. The permitted baseline concept in Section 104(2) is not considered relevant in this case.

2.2 Purpose and Principles of the Act (Part II Matters)

The purpose and principle of the Act is to promote the sustainable management of natural and physical resources. Sustainable management means:

"Managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people, and communities to provide for their social, economic and cultural 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;

b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems;

c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment".

The "Section 104 matters" are to be considered subject to Part II of the Act. This includes the purpose and principles in Section 5 of the Act, and other matters to be recognised and provided for in Section 6, or had regard to in Section 7, or taken into account in Section 8 of the Act.

An analysis of Part II is necessary to assess whether the application meets the overarching purpose of the RMA.

Although there are tensions inherent in the provisions of Part 2, the provisions broadly indicate the level of weight to be given, effectively establishing a hierarchy by giving priority to the matters of national importance in Section 6 over the matters set out for having particular regard to in Section 7 and taking into account in Section 8.

2.3 Matters of National Importance – Section 6 of RMA

The following matters are relevant to this application:

- S.6(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.

- S.6(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

Section 6(a) is relevant only insofar as an abstraction of groundwater may reduce surface flows in waterbodies which may affect their natural character.

Section 6(e) recognises the important role that Maori have to play in this matter due to the stated relationship.

2.4 Other Matters – Section 7 of RMA

The following matters are relevant to this application:

(a) kaitiakitanga:
(aa) the ethic of stewardship:
(b) the efficient use and development of natural and physical resources;
(d) intrinsic values of ecosystems:
(f) maintenance and enhancement of the quality of the environment;
(g) any finite characteristics of natural and physical resources;

2.5 Treaty of Waitangi – Section 8 of RMA

Section 8 requires the Commissioners to take the principles of the Treaty into account in making its decision.

In matters such as this where a resource of high value to Maori is involved Section 8 is particularly relevant. Section 8 essentially requires the parties to act in good faith, enable active participation. The section does not provide a veto to Maori, nor can it be used as a de facto mechanism for allocating resources to Maori. That is a matter for the explicit authority of Parliament, not for a decision-maker.

2.6 Tasman Regional Policy Statement (TRPS)

Commissioners shall have regard to any relevant provisions of the Tasman Regional Policy Statement (TRPS). The TRPS became operative on 1 July 2001 and the policies in the TRPS are largely duplicated in the TRMP.

Relevant objectives and policies in the TRPS are listed in the original application document (pages 41-44); they include General Objectives and more specific Objectives and Policies with regard to tangata whenua interests, urban development, freshwater resources, river and lake resources, and resource management processes.

Section 7 of the TRPS identifies issues, objectives and policies in relation to the Fresh Water Resources of the district. Issues 7.1 (Determining the Allocation of Available Water) and 7.2 (Protection of Natural, Recreational and Cultural Values of Water Bodies) are relevant to the proposed taking of groundwater for the Motueka Coastal Community Water Supply.

These objectives and policies contained in the TRPS are given effect to through the TRMP. If it is considered that the application is consistent with the relevant objectives and policies of the TRMP then it will also be consistent with the provisions of the TRPS.

2.7 Relevant RMA Plans

Section 14 of the Resource Management Act 1991 (RMA) states that no person may take and use water unless expressly allowed by a rule in a regional plan, any relevant proposed regional plan or a resource consent.

As Outlined in Section 1 above, the matter of which regional plan rules are relevant to this application to take water will be dependent on whether any appeals are lodged on Variation 66 to the Proposed Tasman Resource Management Plan (TRMP).

The Tasman Resource Management Plan is operative in part only. Part 5 which covers use of water including the rules in Chapter 31, is not yet operative. However, when the application was first lodged in March 2007, the relevant rules in Chapter 31 were treated as being operative in accordance with Section 19(1) of the RMA. Variation 66 notified in December 2008 had the effect of “masking” the existing rules in the TRMP. Decisions on Variation 66 were notified on 18 December 2009, and those provisions of Variation 66 have effect in the TRMP unless changed through an appeal process.

If no appeals are lodged by the end of February 2010, Variation 66 will merge with the TRMP and the amended rules will then be treated as being operative. If an appeal is lodged, then the amended rules will remain as proposed rules until the appeal is determined.

The relevant (operative) plan is the Motueka-Riwaka Plains Water Management Plan (MRPWMP) that became operative from 16 January 1995.

Section 88A(1A) of the RMA provides that an application for resource consent continues to be processed, considered and decided as an application for the type of activity that it was for at the time it was first lodged. But Section 88A(2) states that any plan or proposed plan which exists when the application is considered **must be had regard to** in accordance with Section 104(1)(b) of the RMA.

In this case the application lodged in March 2007 was for a *non-complying activity* as defined by the rules treated as being operative in the TRMP at the time. The proposed rules in Variation 66 would change the status of the proposed activity to a *controlled activity*. The operative regional plan defines the proposed activity as being a *discretionary activity*.

2.8 Proposed Tasman Resource Management Plan (PTRMP)

The application is to take groundwater at rates that exceed the permitted activity rule (Rule 31.1.2) in the TRMP and therefore requires consent. The application is a new activity and, as discussed above, is assessed as a *non-complying activity* in accordance with Rules 31.1.4, 31.1.6 and 31.1.6A of the PTRMP as they were at the time of lodgement of the application.

Variation 66 has amended Rules 31.1.4 and 31.1.6 in the TRMP that define controlled and discretionary activities for water takes within allocation limits. A new "sub-zone" – now called the Te Matu Zone - has been added to the Cental Plains Water Management Zone; and the combined allocation for these zones has been raised from 855 litres per second, to 1139 litres per second. The result is that the application would now meet the standards and conditions of controlled activity rule 31.1.4 including Figure 31.1E Allocation Limits for Freshwater Takes.

With regard to the TRMP policies relevant to the application, the reader is referred to the applicant's analysis prepared by Frances Lojkine (attached as **Appendix 2)**. The writer largely agrees with the applicant's policy analysis and in this report I only discuss one or exceptions or where there is uncertainty.

2.9 Motueka Riwaka Plains Water Management Plan (MRPWMP)

Rule 6.2.4 of the operative regional plan defines proposed water takes from the Cental Plains and King Edward Zones as being *discretionary activities*. There is no allocation limit imposed.

MRPWMP policies relevant to the application and the applicant's policy analysis prepared by Frances Lojkine is attached as **Appendix 3**. The writer largely agrees with the applicant's analysis except regarding the river loss and spring flow reduction issue raised in Section 3.2.

The MRPWMP indicates that the Central Plains zone has a water suplus that needed further investigation; and that reservation should be made for productive Maori leasehold lands. Policies include:

- seeking to avoid excessive localised reductions in bore yields (5.2.1);
- avoiding significant adverse impacts on important instream and Maori values of the Motueka or Riwaka rivers or of the coastal springs on the plains (5.2.4)

- reserving sufficient groundwater and surface water within the Central Plains and King Edward Zones to meet all present and foreseeable future domestic, urban, and irrigation needs, including irrigation needs in respect of Maori reserved lands, within those zones, as well as certain community supply needs outside those zones (5.2.5)

- allocating water for transfer from the Cental Plains and King Edward Zones during low flow periods, only when Council is satisfied that sufficient water remains to supply the identified needs (5.3.1)

Generally the provisions of the MRPWMP have been adopted into the TRMP, with changes such as the water allocation limits that reflect further investigation of the aquifers since 1995. Therefore it is considered that little weight should now be given to the provisions of this plan.

3. ASSESSMENT OF EFFECTS

3.1 Principal Issues (Actual and Potential Effects on the Environment)

The fundamental issue for the proposed activity is the degree of certainty in the science and findings of the groundwater investigations that support the application. The fundamental issue is therefore:

(a) that the rates of take are sustainable taking into account any effects on the environment including any effects on seawater intrusion, on Motueka River flow, on other Motueka Plains groundwater users including security of supply issues.

The other principle issues and the actual and potential effects on the environment were:

(b) any direct interference (drawdown) effects of pumping at the proposed rates on neighbouring bores including consented and permitted take users, including having regard to future capital expenditure such as replacement bores and pumps if users were to “fully penetrate”.

(c) public concern about transferring water out of the zone or Motueka catchment.

(d) any relevant RMA issues arising from the Treaty of Waitangi claim.

(e) Maori cultural values and any effects on the relationship of tangata whenua and the water of the Motueka Plains.

(f) the need for the water, the availability of alternatives and proposed monitoring of Scheme water use including water metering to ensure that water taken is used efficiently and monitoring actual effects on the environment

3.2 Allocation Limit

Importantly, the new allocation limits adopted for the Central Plains and the Te Matu Zone are deliberately conservative to minimise any adverse effects including for the Hau Zone. From the application, the writer understands that the proposed take equates to approximately two-thirds of the maximum additional take that could be

sustainably abstracted from the Central Plains Zone and that provides a significant margin of safety. The technical evidence has been reviewed by SKM who raise various questions to be addressed at the hearing.

Note 1: Under Schedule 31.1B TRMP, water metering applies for existing consent holders in the Central Plains Zone effective on 30 November 2010.

Note 2: Various references in the application to the "Transition Zone" may be confusing to the reader as that zone has now been amalgamated in an expanded Hau Zone.

3.3 Pumping Effects on the Motueka River

In the AEE, the applicant acknowledges the importance of the Motueka River, including for iwi. The AEE also acknowledges the effects of proposed Scheme pumping on Motueka River flow and identifies a 13% increase in river losses (186 l/sec) during a 24 year drought.

The application does not appear to include an assessment of the cumulative effects of groundwater pumping on Motueka River flow in terms of Policy 30.1.10 TRMP. This omission/oversight may explain the concern of many submitters regarding adverse effects on river, on instream values, landscape and mauri.

While not a Water Conservation Order (WCO) river below the Shaggery, the TRMP policies continue to apply to the lower reaches of the Motueka River in the absence of a stated allocation limit. TRMP Policy 30.1.10 suggests the allocation limit should be in the range of 10% of the 5 year (7 day) low flow but, if the river values are relatively low, up to 33% can be allocated. Based on a 7 day low flow at Woodmans Bend of 9,696 l/sec, a 10% allocation limit would be 969.6 l/sec while 33% is 3,200 l/sec. The river flow that will be lost as a result of cumulative groundwater pumping is not stated.

The TRMP in Schedule 30.1 lists possible water body uses and values applying to the Lower Motueka River as contact and non-contact recreation and cultural, spiritual and landscape values. Jet Boating NZ (Submitter #165) also value the river and conditionally support the proposal provided a condition is imposed that there be no significant effect on the flow of the Motueka River. The values expressed by Maori and other submitters clearly favour a conservative limit.

The writer is aware of other work and investigations including involving Nelson Marlborough Fish & Game that have focused on the effects of river loss on instream values etc in the Lower Motueka River. This work may well support "that the level of river losses under drought conditions continue to be minor" but the information has not been presented in the application and Commissioners need to satisfy themselves that the effects are indeed minor.

3.4 Effects on Other Zones

The Council's TRMP recognises that water availability and security of supply is critically important for water users, in this case groundwater users. The applicant's modelling acknowledges the linkage with the Hau Zone (includes Transition Zone) and necessarily must be conservative to avoid adverse effects including on already marginal wells that cannot be deepened, and on seawater intrusion. SKM have

reviewed the technical evidence and Commissioners need to satisfy themselves that existing users such as in the Hau Zone are unaffected by the proposal.

3.5 Effects on Shallow Well Users

The Council's TRMP recognises that water availability and security of supply is critically important for water users, in this case groundwater users. The applicant's AEE acknowledges interference affects on existing bores and water use but argues these affects are small compared to natural groundwater level fluctuation. The applicant does however acknowledge that already marginal bores will be adversely affected by the Scheme's pumping during drought years.

The applicant identifies that Policy 30.1.14 and Policy 30.2.2 TRMP specifically exempt from protection those bores that do not fully penetrate alluvial aquifers from protection in the consideration of consent applications. The writer understands that this policy approach has been confirmed through the reports prepared by TDC policy staff in relation to Plan Change 13 and Variation 66.

The application states that all affected bores are located within the service area of the proposed MCCWS, so an alternative water source will be available to them.

The cost implications of connecting to the TDC reticulation are an issue for numerous submitters and many consider their costs should be paid by the beneficiaries of the MCCWS water.

A related issue is the timing of the provision of the TDC reticulation to the affected area and the writer agrees with submitter's that it needs to be available at the same time the scheme is commissioned. Alternatively, it could be progressively "rolled out" as the rate of pumping and effects increased. There must be an alternative for affected households if they are to abandon their private bores.

With regard to Policy 30.1.14, the writer accepts the reasons for exempting from protection those bores that are not sufficiently deep. The writer notes however that Policy 30.1.14 (e) specifically refers decision makers to take account of the "costs of full penetration" and, given the number of bores (estimated at 260) affected by the proposal, this is potentially significant. While it would be ridiculous and unnecessary for households to have fully penetrating bores extending 20 m to the bottom of the aquifer and drawing water from the entire thickness of the aquifer, the cost of drilling, fitting a new pump, obtaining Council consent will cost an individual in excess of $4000.

While Policy 30.1.14 and 30.2.2 TRMP may not require the protection of bores that are not "fully penetrating", this does not mean the effects on households should and can be ignored. The Commissioners, under Section 108 of the Act, can adopt conditions for the purpose of remedying an adverse effect of an activity. Whether this should extend to the applicant paying some or all of the costs of connecting affected households is a matter for the Commissioners to decide.

3.6 Review Condition

The applicant holds various water take consents on the Motueka-Riwaka Plains including for the supply of Motueka township. As acknowledged by the applicant, a large number of households in Motueka are not connected to TDC reticulation and a significant proportion of the water currently allocated for community supply for Motueka is unused.

The writer understands that full design of the proposed MCCWS is incomplete and that the applicant wishes to continue using the existing bores and infrastructure at least in the short to medium term. The writer understands that the existing TDC allocations are intended to be retained, and are not replaced by this application. In the future, it is possible that the allocations at the Recreation Centre and Fearon's Bush will transfer to the well field at Parker Street.

The applicant's planner advises that they anticipate that a review condition will be imposed on any water permit granted, consistent with the requirements of Policy 30.2.10 which states:

Policy 30.2.10
To regularly review permits to ensure the allocation authorised by the permit reflects what is actually needed by:

(a) encouraging permit holders to relinquish permits or, if relevant, to transfer the point at which water is taken, and/or lease or permanently transfer permits wholly or in part to another person if the water allocated is no longer being used, except in over-allocated zones where the transfer is likely to lead to an increase in irrigated area or amount of water used; or

(b) reducing allocations to reflect bona fide use.

The writer considers this a reasonable and appropriate and it is adopted as a draft condition.

At the hearing it is recommended that the Commissioners consider and satisfy itself that the proposed allocations are realistic including having regard to the applicant's existing allocations for Motueka Community Supply. In the rural area, landowners may express a desire for reticulated water but the initial support can disappear when they learn of the actual connection cost. In this case, the proposed rural supply rate (1.5 m^3) has the effect of excluding stock supply which will reduce the Scheme's attractiveness to rural users.

3.7 Maori Concerns With Transfer/Export

The report by Mitchell Research clearly sets out many of the concerns that Maori have with this proposal. The writer does not feel qualified to comment with any great certainty on the severity of the impacts felt by Maori. However, the following observations are made which may put some context around the issues.

With regard to the "export" of water out of the catchment, the policies applying to transfer out of zone under the MRPWMP are included in Appendix 3. Regarding the TRMP, there are few restrictions on piping out of a zone and catchment and

numerous such schemes exist. Many of the destinations that the water would be going are either still within the Motueka catchment (Dovedale) and would re-enter the same system, or else a very close catchment which still flows immediately adjacent to the Motueka plains (Upper and Lower Moutere, Mariri and Tasman Village). It is acknowledged that export of water to Mapua and the southern Rural 3 zone including Redwood Valley is well separated from the water's catchment of origin and it is expected that Maori concerns may be greater with the magnitude of this movement away from the Motueka catchment. However, based on the figures in the application, the percentage of water to be moved to the Mapua urban area, the southern Rural 3 area and other Rural sites is in the order of 33 percent. 51% would be used for the Motueka Urban area and the balance would supply the marginal areas stated above such as the Moutere Valley

The Mitchell Research report referred to one interviewee who expressed concern about the water being moved as far as the Waimea catchment. It is likely that many Maori and non-Maori alike would consider such a move, culturally, to be a step too far.

It is probably fair to say that at the time the application was notified and submissions were received there was a great deal of concern in the community about wholesale export of water from the Motueka area and that there would be a lack of water to provide for the economic, social and cultural wellbeing of Motueka. Since then a significant amount of work has shown that the water is available and that only a minority of it will be exported. However, whether this adequately addresses the concerns held by Maori groups and individuals will need to be gauged by the Commissioners.

To address some of these concerns relating to the transfer of water, it may be appropriate to impose specific conditions restricting the volume that can be transferred out of zone, including separate metering of this supply. Transferred water could also be restricted to various uses but it is acknowledged that the supply volume is a more practical control. Restricting the rural supply to 1.5 m^3/day is likely to see connections for high quality water supply only.

An important factor on Moutere Clays, is that any water supplied not exceed the capability of an onsite wastewater treatment system.

Given that full design of the proposed MCCWS is incomplete it is appropriate that any consent be conditional on the development by the applicant of a scheme management plan (SMP) that documents the scheme supply area(s) and the total volume allocated for each supply area and the rates of supply and other conditions of supply in each area. The SMP should include "as-builts" showing actual pipeworks, location of water meters etc and document an appropriate leak detection program.

The SMP should be available for inspection by Council monitoring staff if requested and the data form the basis for any review of conditions.

3.8 Treaty of Waitangi Claim

Commissioner Andrew Fenemor in making his recommendation to the Council on Plan Variation 66 considered this matter and stated that he heard that there is relatively little Crown-owned land likely to return to iwi in the Motueka, Riwaka, and

Moutere valley areas which would require water to be reserved, and exact blocks are unknown. He said that the amount of land that may be irrigable cannot be determined at present.

The writer is satisfied that give this small amount of land in the subject area that may be returned to iwi and the high level of conservatism in the groundwater modeling and allocation regime, that there will be scope to address the results of a Treaty claim when the exact nature of the claim and the agreement are reached.

Another potentially relevant matter is the Statutory Acknowledgement proposed for the Motueka river which is a device to keep iwi informed and involved in any matters on the river which may be relevant to their interests. It is not anticipated that this proposal will have any implications or conflicts with that Statutory Acknowledgement.

3.9 Availability of Alternatives

The writer accepts there is demand for high quality household water in Coastal Tasman including as a result of Rural 3. It is also apparent that many Rural 3 landowners are prepared to pay considerable sums for a reliable potable supply going by the cost of drilling private bores.

Regarding the availability of alternatives, groundwater and rainwater systems are currently the main alternative supplies. Under the current TRMP rules, all new houses require both a potable water supply and a firefighting supply. For areas where there is no available TDC reticulated urban supply, new households are required to install a 25,000 litre tank fitted with a 50mm Camlock outlet for possible firefighting supply.

Groundwater is potentially an option at Tasman as demonstrated by one deep bore drilled just east of Tasman and bores 200m or more deep between Tasman and Mariri yield relatively good volumes. This also applies in the Moutere Valley. However, again this would require TDC to purchase an existing bore and water permit as no new consents can be granted in this area.

In contrast, east of Tasman including at Mapua the groundwater yields are considerably lower and water quality tends to be poorer and contain more iron. This fact was confirmed by TDC who drilled various exploratory bores. My understanding is that none were considered viable candidates for community supply including firefighting use.

Throughout Rural 3, consents to drill new bores (for private water supply) continue to be granted subject to a minimum setback to neighbouring bores and subject to the (permitted activity) limit of 5 cubic metres per day per bore. The extent of potential development of housing in Rural 3 coupled with the setback restriction means that groundwater supplied from private bores can provide only a limited supply.

3.10 Noise

The application identifies noise as a potential issue resulting from the activity. From the TRMP the wellfield property is zoned Rural 1 while the neighbouring land to the east is zoned Residential. Parkerfield Place (Residential Zone) is already fully developed with houses. Submission numbers 15, 243, 283 and 311 refer to noise

from the bore field as a concern. Noise may emanate from the pumps and their motors, movement of water in pipes, a pumping station and use of an emergency generator. The applicant has advised that all of the pumps will be submersible (about 12 metres underground) and the piping will be underground. The most likely source of noise would be a pump station which will move the water on through the system once the submersible pumps have brought it to the surface.

The TRMP sets the night time noise limit at the residential boundary at 40 dB. However, Graham Caradus (Council's Environmental Health Coordinator) informed the writer that in situations where the nature of the noise may be a constant hiss, whine or hum through the night it is more appropriate that a limit above the background noise be set. This method is set out in the relevant New Zealand noise standards which Rule 17.5.2.1 of the TRMP also refers. Mr Caradus said that a level of 10 dB above the background would be the limit that may cause complaints. He recommends that a limit of 5 dB above the night time background level be the limit to maintain residential amenity. Such a condition is recommended.

Mr Bob Askew who was previously an environmental health officer for the Tasman District Council attended the pumping test and in a personal communication he stated that submersible pumps do not cause any noise problem and there are a number of water abstraction sites immediately adjacent to residential areas which do not cause any complaints.

Overall, while it is not anticipated that there will be any noise problem resulting from the operation of the bore field, conditions are recommended to ensure that residential amenity is maintained for the immediate neighbours in the event that surface pumps or an emergency generator are used.

3.11 Other matters

This section contains brief comment on some additional submissions and other matters as follows.

- Regarding the possibility that crops may need greater rates of irrigation, this is in part recognised in relation to the soil type allocation rate in Fig 31.1D TRMP where up to 20% more can be allocated if there is scientific evidence to support the increase. Having said that, it has never been the intention to provide for all crops rather to encourage high valued crops that use water efficiently.

- One submitter identifies the relatively recent trend to use groundwater for frost protection which was unlikely to have been foreseeable even 5 years ago. Typically irrigation and frost protection uses do not coincide and this, coupled with the relatively small demand for frost protection means this is not considered an issue.

- SKM recommend mitigating any potential effects on neighbouring bore users including to reflect a staged approach to development of the well field to manage potential compensation for water losses. SKM recommend a condition which requires monitoring in some of the neighbouring bores to allow comparison with the calculated interference effects. A draft condition is adopted.

4. CONCLUSIONS

The writer's assessment is that the application potentially meets the overarching (sustainable management) purpose of the RMA provided the questions raised in this report and in the SKM report are satisfactorily answered at the hearing and the applicant accepts the need to remedy the adverse effects of their pumping.

As a *non-complying* activity, the writer also considers that the application meets at least the policy and objective gateway test under Section 104D(1)(b) of the Act. Whether it also passes the effects gateway (104D(1)(a)) is unclear and is left to the Commissioners' findings.

Furthermore, provided the questions raised in this report and in the SKM report are satisfactorily answered I consider that the application is consistent with the TRMP particularly the decisions on Plan Change 13 and Variation 66 to the TRMP.

However, in the circumstances it is not considered appropriate for TDC staff to make a recommendation either to grant or decline.

4.1 Duration of the Consent

The consent term currently applying in the Central Plains Zone (CPZ) (see Schedule 31.1A TRMP) results in all existing consents expiring on 31 May 2015. Replacement consents for the CPZ will receive an eighteen year term consistent with Schedule 31.1A resulting in a replacement common expiry date of 31 May 2033. Regarding expiry dates, the TRMP in Policy 30.2.8 states:

To set a common expiry date for water permits to take water in each water management zone, to ensure consistent and efficient management of resource.

The TRMP Schedule 31.1A also states, if an application is made up to three years before, in this case, 2015, then the Council can grant the consent for the following date. Given the timing of this application, the TRMP specifies an expiry date of 31 May 2015.

The consent term sought by TDC Engineering in their application is 35 years which would result in an expiry in 31 May 2045. The applicant argues that the nature of the investment and the need for certainty requires a term of 35 years.

That the applicant has applied for the maximum 35 year term under the RMA is of concern not just for this activity but for all other TDC water permits which are currently granted with the dates specified in Schedule 31.1A TRMP.

Having said that, the TRMP Schedule 31.1A is not a directive (i.e. is not a standard or term) however the terms are adopted for good reasons and are shortened (i.e. from the maximum 35 years) to reflect the degree of uncertainty in that water zone.

Further reasons for retaining the common term approach are:

- For consent holders, replacement consents (ie renewals) under the TRMP are controlled activities, which give significant certainty to consent holders;

- A shorter term is consistent with case law where there is uncertainty;

- The argument that the consent can be reviewed pursuant to a consent condition is less certain and the burden of costs of review tend to fall to the general rate payer; and

- The potential for precedent given the large number of other users in the zone.

The writer rejects the requested 35 year term and recommends the dates as specified in Schedule 31.1A TRMP.

Neil Tyson
Consent Planner

RESOURCE CONSENT DECISION

Resource Consent Number: RM070187

Pursuant to Section 104B of the Resource Management Act 1991 ("the Act"), the Tasman District Council ("the Council") hereby grants resource consent to:

Tasman District Council
(hereinafter referred to as "the Consent Holder")

Activity Authorised by this Consent:

The taking and use of groundwater for community supply relating to the operation of the Motueka Coastal Community Water Supply

Location Details:
Wellfield Location: Parker Street, Motueka
Property Valuation: 1956001703
Legal Description: Lot 1 374788

Consent is granted for a term expiring on **31 May 2015** and subject to the following conditions:

CONDITIONS

1. Site, Take and Use Details

Category of Source:	Groundwater
Zone	Te Matu
Catchment:	Motueka-Riwaka Plains
Maximum rates of take authorised:	310 litres per second 1,111 cubic metres per hour 20,000 cubic metres per day 140,000 cubic metres per week
Bore Details	
Well Numbers:	WWD (up to nine bores to come)
Wellfield Location co-ordinates:	Easting:2509933 … Northing: 6011307 (NZ Map Grid Datum)
Meter Required:	Yes

2. Water Meter Specifications, Maintenance and Readings

The Consent Holder or their agent shall, at their own expense, install, operate and maintain a water meter that complies with the Council's Water Meter Specifications as stated in the Tasman Resource Management Plan.

3. The Consent Holder shall as a minimum record their meter reading on the same day each week and, throughout every November to April inclusive, shall return their weekly meter readings to the Council's Co-ordinator, Compliance Monitoring at the end of each two week period or by the dates specified each year by Council.

The Consent Holder shall maintain a complete and accurate record of their weekly meter readings and supply these meter readings to the Council upon request.

Monitoring

4. Prior to the Scheme's commissioning, the Consent Holder shall submit to the Council's Co-ordinator, Compliance Monitoring a Scheme Management Plan (SMP) that documents:

- All monitoring volunteered in the application including salinity monitoring at two coastal bores; and
- Documents the monitoring of potential effects on neighbouring bore users, including taking into account a staged (wellfield) development approach and the monitoring shall be sufficient to assess and compared with the calculated interference effects; and
- Documents the supply area(s), the total volume allocated for each supply area, the rates of supply per connection and any other conditions of supply in each area; and
- Documents the "as-built" Scheme pipeworks, location of water meters etc; and
- Documents an appropriate leak detection program with the objective of reducing scheme losses below 5% including a proactive program to minimise illegal connections.

The SMP should be available for inspection by Council monitoring staff if requested provided it was not more frequent than six monthly.

5. The Consent Holder shall provide a copy of the SMP to the Council's Co-ordinator, Compliance Monitoring within two years of the commissioning of the Scheme and thereafter at two year intervals and the SMP shall be received by Council no later than 31 May each year the report is required.

6. Area Supply Restriction

The Consent Holder shall restrict the supply to the following areas as follows:

Area		**Volume (m^3)**	
Motueka Urban	At least	11,359	51%
Mapua Urban	No more than	3,865	17%
Tasman Village	No more than	444	2%
Riwaka	No more than	1,098	5%
Rural 3 North	No more than	1,970	9%
Rural 3 South	No more than	1,611	7%
Rural Areas	No more than	2,028	9%
Total		**22,373**	

No water from the scheme shall be supplied south of the extent of the Rural 3 zone.

7. Volume Supply Restriction

The Consent Holder shall restrict the supply of Scheme water to those properties and user located outside of the Motueka Plains to a maximum allocation for rural connections of 1.5 cubic metres per day per property. In addition, the Consent Holder shall advise their users that the quantity taken and used may be reduced if the volumes exceed the capacity of an onsite wastewater treatment system.

8. The Consent Holder shall pay the reasonable costs associated with the monitoring of this consent including, if and when requested by Council, the full costs associated with water meter calibration to confirm their meter's accuracy is within the range of ±5% provided that meter calibration is not more frequent than five yearly and the full cost of monitoring compliance with the conditions of this consent, including the reasonable costs associated with maintaining a water meter-usage database.

9. The Consent Holder shall keep such other records as may be reasonably required by the Council and shall, if so requested, supply this information to the Council. If it is necessary to install measuring devices to enable satisfactory records to be kept, the Consent Holder shall, at his or her own expense, install, operate and maintain suitable devices.

10. Promotion of Efficient Water Use

The Consent Holder shall through the appropriate Council asset management plans, Scheme operation contracts etc, ensure that water use efficiency outcomes remain a high priority, and such plans and contracts shall include, but not be limited to, appropriate, timely and regular leak detection programmes, low flow restrictor checking, water meter accuracy checking and user education including that the supplied water is for high quality use.

Noise

11. Noise generated by the activity measured at the boundary of the residential zone to the east of the bore field shall not increase the background night time noise level by more than 5 dB. However, this restriction shall not apply to the use of an emergency generator which is controlled by Conditions 12 and 13.

Notwithstanding the above, if the background noise cannot be determined or is in dispute then the noise of the facility shall not exceed an $L_{Aeq(15\ minutes)}$ of 35 dB.

Where compliance monitoring is undertaken in respect of this condition, noise shall be measured and assessed in accordance with the provisions of NZS 6801:2008, Measurement of environmental sound and NZS 6802:2008, Acoustics – Environmental noise.

12. Noise generated by the activity on the site, when measured at or within the boundary of any site within the residential zone shall not exceed:

	Day	**Night**	**Saturdays 6.00 pm to 9.00 pm, Sundays and Public Holidays**
$L_{Aeq(15\ minutes)}$	55 dB	40 dB	40 dB
L_{AFmax}		70 dB	

Note Day = 7.00 am to 9.00 pm Monday to Friday inclusive and 7.00 am to 6.00 pm Saturday (but excluding public holidays).

This restriction shall control all noise from the site including that of the emergency generator.

Where compliance monitoring is undertaken in respect of this condition, noise shall be measured and assessed in accordance with the provisions of NZS 6801:2008, Measurement of environmental sound and NZS 6802:2008, Acoustics – Environmental noise.

13. The emergency generator shall only be used at times when mains power supply is unavailable, except as necessary for occasional testing of the generator.

Review Condition

14. The Council may within three months following the anniversary of the granting of the consent each year review any or all of the conditions of the consent pursuant to Section 128 of the Resource Management Act 1991 for all or any of the following purposes:

a) to deal with any unexpected adverse effect on the environment that may arise from the exercise of the consent; and/or

b) to require the adoption of the best practical option to remedy or reduce any unexpected adverse effects on the environment; and/or

c) to comply with requirements of an operative regional plan, including any allocation limit, minimum flow regime, rate of use limit, or rationing or rostering restriction; and/or

d) to comply with relevant national environmental standards made under Section 43 of the Resource Management Act 1991; and/or

e) to reduce the quantities of water authorised to be taken if the consent is not fully exercised.

15. Pursuant to Section 125 of the Act, this consent shall not lapse until ten years after the date of commencement.

(Only needed if term is greater than recommended)

OTHER ADVICE NOTES

1. Access by the Council or its officers or agents to the land subject to this consent is reserved pursuant to Section 332 of the Resource Management Act 1991.

2. The Consent Holder shall pay the reasonable costs associated with the monitoring of this consent.

APPENDIX 1

Before the Commissioners appointed by Tasman District Council.

In the matter of	**The Resource Management Act 1991.**
And in the matter of	**Resource Consent Application RM070187 By Tasman District Council to take and use groundwater for the purpose of a community water supply**

Section 42A Officer's Report

Date of Hearing: 1 March 2010

STATEMENT OF EVIDENCE OF GILLIAN HOLMES

Dated: 17 February 2010

SKM

Table of Contents

Name and Qualifications

My name is Gillian Holmes. I am a Hydrogeologist for the consulting firm Sinclair Knight Merz Limited (SKM) and have been a professional environmental consultant since 2004. My qualifications include a Bachelor of Science (BSc) in Geography, and a Master of Science from the University of Otago with a thesis in Groundwater Modelling.

My current position is Intermediate Hydrogeologist within the Natural Resource Management team of SKM. I have technical expertise in Hydrogeology. My knowledge and experience covers a wide spectrum including data collection, manipulation and analysis; groundwater modelling; report writing; preparation of resource consent applications; and community and stakeholder engagement.

Code of Conduct

I have read and agree to comply with the Code of Conduct for Expert Witnesses issued by the Environment Court on 25 June 2009.

Quality Assurance

My evidence has been reviewed by our Principal Hydrogeologist Jon Williamson, who is based in SKM's Auckland office.

Brydon Hughes from SKM's Christchurch office completed an initial review of the application in 2007 and issued a Section 92 letter in March 2007 with the assistance of Jon Williamson.

Introduction

I have been commissioned by Tasman District Council to review the Tasman District Council's application to take and use groundwater for the purpose of a community water supply.

The objectives of my evidence are to provide an independent assessment of:

The appropriateness of the methods used to determine the assessment of effects including aquifer testing, numerical groundwater modelling, and interference effects on neighbouring bores; and

The confidence or certainty that can be applied to the assessment of environment effects based on the results from these methods.

In preparing this evidence, I have reviewed:

The relevant background information including the Resource Consent Application and reports prepared to support the assessment of environmental effects; and

Other background information on the nature of the application, including Council's response to the Section 92 request issued by SKM in March 2007.

These papers will be referenced where appropriate and are listed in Section 13.

The structure of this evidence follows that of Mr Weir (10 February 2010). The evidence of Mr Weir was provided to me on 10 February 2010. I understand that the applicant will be pre-circulating all its evidence once it has been complied by its legal representative (the technical evidence was the first to be completed). I also understand that it is expected that this evidence will be circulated on or around 17 February 2010 giving all submitters time to see the evidence before the hearing.

Background

The Engineering Services Department of Tasman District Council lodged an application in March 2007 to abstract up to 20,000 m^3/day from a well field in the Central Plains Zone of the Motueka-Riwaka Plains Aquifer. The purpose of this abstraction is to service the proposed Motueka-Coastal Community Water Supply.

The Motueka-Riwaka Plains comprise of alluvial outwash gravels deposited primarily by the Motueka and Riwaka Rivers in the form of a coastal delta (Aqualinc, 2007a). The gravels vary in thickness, with the thinnest gravels occurring at the margins of the plains (i.e. around 6 m thick at Lower Moutere) and thicken to approximately 30 m in the Central Plains zone.

The gravels are heterogeneous across the plains. To the south, the valley-floor deposits are mixed with material eroded off the surrounding hills and as such have a high percentage of fine sand, silts and clays. In comparison, the gravels in the Central Plains area are generally clean and consist of well rounded clasts mainly of granite, sandstone, siltstone and basic igneous rocks in a granite-derived sand matrix (Aqualinc, 2007a). Adjoining the Riwaka River, the gravels were deposited by the river and are mixed with colluvial granitic outwash.

A schematic north-south cross-section of the Motueka-Riwaka aquifer system is shown in Figure 1 (from Aqualinc, 2007a). There are three main aquifer systems that occur in the Central Plains. These are separated by the presence of claybound gravel aquitards. In terms of management, Tasman District Council considers the two lower leaky confined aquifers to be one water bearing layer.

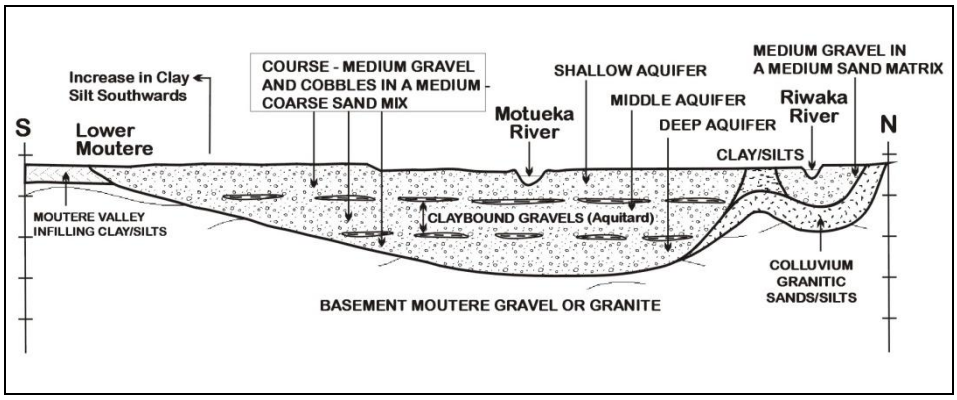

***Figure 1**: North-south schematic cross-section of the Mouteka-Riwaka Plains Aquifer. Source: Aqualinc (2007a).*

The consent application was supported by four reports prepared by Aqualinc that highlight the investigations that have been undertaken. These investigations included:

- ***Aquifer testing of the deep aquifer in the proposed well field location (Aqualinc, 2007a);***
- ***Well field design including the assessment of sustainable yield of the well field and potential interference effects (Aqualinc, 2007b);***
- ***An update of the original groundwater model completed by C Robb in 1999 and 2002 (Aqualinc, 2007c). The original model by Robb had previously been used to establish the amount of groundwater which could be sustainably abstracted from the Central Plains Zone. The updated model concluded that an additional 33,000 m^3/day above the current allocation limit could be sustainably abstracted from the aquifer.***

- ***A technical assessment of the environmental effects of the proposed abstraction have been completed using the modelling results for aquifer sustainable yield assessment and effects on surface water bodies, with an analytical approach used to assess interference effects on neighbouring bore owners (Aqualinc, 2007d).***

SKM completed an initial review of the technical components of the resource consent application. A Section 92 Request was issued in March 2007 to clarify several points outlined in the application. The Section 92 requested information on the following:

1. ***Assessment of permitted groundwater use to better define the existing groundwater usage and how this may be impacted by the proposed abstraction;***

2. ***Further comments outlining the spatial distribution and lateral continuity of the aquifer and aquitard layers to reconcile the conceptual aquifer model with local hydrogeological conditions;***

3. ***Additional information regarding surface water flows and spring flows to improve the definition of potential impact of the proposed abstraction;***

4. ***An assessment of the apparent downward trend in long-term aquifer levels and the implications that this may have in terms of the long-term sustainable abstraction from the aquifer system.***

5. ***A sensitivity analysis to be undertaken on the analytical assessment of interference effects on neighbouring bores given the heterogeneity and a comparison between the results of the analytical assessment and the numerical model.***

6. ***A summary of the aquifer hydraulic properties and streambed conductance values derived from previous aquifer testing.***

7. ***Output from the numerical groundwater model including zonation of hydraulic parameters, model water budgets, and justification for the limited calibration and verification time frames.***

8. ***Comments on the difference between the values for hydraulic connection to the Motueka River derived from aquifer testing and those within the model, and a water balance assessment to improve the definition of the extent and magnitude of stream depletion effects.***

9. ***An analytical or numerical assessment of the position of the saline interface at the Fernwood monitoring bore.***

A response was received from Council in June 2007 with many of the points adequately addressed. During my evidence, reference will be made to the responses provided to Questions 2, 5 and 6.

Additional aquifer testing was completed by the applicant in April 2007 that concentrated on the shallow aquifer in order to further define localised hydrogeological conditions and river bed hydraulic parameters (Aqualinc, 2007e).

Further enhancement of the Motueka-Riwaka groundwater model was undertaken in 2008, to incorporate additional groundwater monitoring and riverbed cross section data that had been collected since the model was previously calibrated (Aqualinc, 2008). Incorporation of this information within the model was undertaken to provide more accurate prediction of the effects of saltwater intrusion. As such the new model was used to determine a new sustainable level of abstraction from the Central Plains Zone. This limit was calculated to be 24,500 m^3/day given restrictions in the Hau Plains.

Summary and Conclusions

The methods used during aquifer testing, including data analysis, well field design and in determining well

interference effects have been found to be appropriate.

Bore interference effects, while not tending to indicate a significant problem, nevertheless indicate some reduction in the ability of existing bore owners to continue to obtain the same rate of groundwater yield as currently obtained.

There is uncertainty in the layer thicknesses, hydraulic parameters and recharge coverages in the groundwater model. This uncertainty relates to an apparent higher hydraulic conductivity in the south of the model domain that appears supportable by the conceptual geological understanding. The potential implications of this are:

Under prediction of groundwater depressurisation;

Over prediction of sustainable yield;

Higher groundwater recharge required to maintain measured groundwater levels, hence over prediction of sustainable yield.

Further clarification, which is expected to come forthcoming during the hearing process, is required to fully understand the potential uncertainty in the model predictions.

Given the uncertainty in the model predictions, only general comments were provided on the results of the modelling. Specific conclusions could be drawn once clarification has been obtained and/or sensitivity analysis on the model parameters in question is undertaken.

The sustainable yield assessment indicates that an additional 24,500 m^3/day can be abstracted from the aquifer. This value has reduced from the 33,000 m^3/day simulated from the previous groundwater model.

An assessment of effects has been undertaken on the effect of the proposed abstraction on rivers and springs in the aquifer system. There are concerns regarding the level of effects simulated (12 to 16 % reduction in low flow) within the Motueka River and springs, particularly as the uncertainty in model parameters might increase the level of effect.

The temporal and spatial effects of the abstraction were also investigated. The modelled groundwater impacts did not appear to be significant and were consistent with the analytical analyses undertaken. However, the proposed condition of consent regarding the staged development of the well field will enable the level of groundwater decline to be closely monitored at each stage of development.

Aquifer Testing and Analysis

As indicated above, Tasman District Council have undertaken separate aquifer tests of the shallow and deep layers underlying the proposed well field as outlined in Aqualinc (2007a) and (2007e).

The aquifer testing was conducted on the deep aquifer in February 2007 at the site of the proposed well field. Three production bores and six monitoring bores were drilled for the test. The production bores were screened within the deep aquifer, located at approximately 20 metres at this site. The

depths of the observation bores were between 9 and 19 metres which enabled groundwater levels within the shallow and deep aquifer to be monitored during the test pump exercise. In addition, two existing bores at a greater radius from the well field (between 420 and 635 metres) were also monitored, with these bores screened in the deep aquifer between 17.5 and 18.5 metres. The bore 635 metres from the well field is located on the opposite side of the Motueka River (Aqualinc, 2007a). The testing consisted of three short step discharge tests on each of the production bores (WWD2175, WWD2179 and WWD2182) and a 3 day constant rate test on one of the production bores (WWD2179).

Additional aquifer testing was conducted on the shallow aquifer at the well field site in April 2007. This testing was completed to verify the results from the previous testing and to obtain additional parameters for the shallow aquifer. The pumped bore was an existing bore drilled during the previous aquifer testing (WWD2547) and is screened in the shallow aquifer between 6.2 and 8.2 metres. All of the monitoring bores used in the deep aquifer test (with the exception of WWD2182) were monitored during this testing. The testing consisted of a 1 day constant rate test.

I consider that the aquifer testing procedure was undertaken in an appropriate manner.

The methods used for analysing the constant rate data included a method developed by Dr. Bruce Hunt from the University of Canterbury (Hunt, 2006), which incorporates a multi-layer leaky aquifer system and allows for a partially penetrating river.

I consider that these analysis procedures are appropriate in this hydrogeological setting, as outlined in paragraph 0 of this evidence.

The aquifer test analysis method used enabled the comparison of the observed and calculated water level over the length of the aquifer test. The calculated

water levels closely align with the observed (corrected) water level, which provides a good level of confidence in the calculated aquifer parameters.

However, it should be borne in mind that aquifer testing only provides an understanding of the hydraulic conditions within the aquifer at the specific location between the production and observation bores. Extrapolation of this data to other areas needs to be undertaken with clear geological justification.

Well Field Design

The proposed well field design was determined by Aqualinc and is outlined in Aqualinc (2007b). This report covers the production bore sustainable yields, well field layout and potential interference effects for both within the proposed well field and within neighbouring bores.

The sustainable yield of each production bores within the proposed well field was calculated. While this information is useful for the management of the well field, it is not such an important issue for the Regulator2, who would likely consider the sustainable yield of the aquifer system of key importance.

However, based on specific capacity3 calculations completed as part of this review using previous step test results for WWD2179, the sustainable yields for the proposed bores appear reasonable. For example, the average specific capacity of WWD2179 during the step test was 2,117 m^3/day/m, while the calculated well yield equates to 930 m^3/day/m.

The interference effects specific to the well field performance was calculated. Once again this information is only applicable to the operators of the well field.

2 Since the applicant is a unitary authority responsible for both municipal provisions and also management of natural resources, I make the distinction in this document of the management role, through the use of the term "Regulator".
3 Specific capacity: the rate of discharge of a well per unit of drawdown m^3/day/m.

Wider-Area Interference Effects Assessment

Potential well interference effects over the wider area as a result of abstraction from the proposed well field, which are of greater importance to the Regulator, were calculated using the aquifer test results and the selected well field design. Specifically, interference effects on existing neighbouring irrigation bores and an assessment on generic bores located at a larger radius from the well field were undertaken. The assessment on the generic bore assessment is explained in paragraph 0.

Specific interference effects were determined for five existing neighbouring bores (located between 289 and 359 metres from the centre of the well field) using the Hunt (2006) method, which was previously used for the aquifer test analysis. The interference effects calculated for these five bores ranged between 0.5 and 0.7 metres.

The potential effect of this level of interference on each of the bores was made through the comparison of minimum pumping water level against the available drawdown. The maximum abstractable flow was then determined using a flow-drawdown relationship, based on test pumping data from nearby bores.

This assessment of effects is considered conservative based on our comparison to the specific capacity calculated for each bore as part of this review. For example, based on the yield and drawdown values shown in Table 14 of Aqualinc (2007d), the specific capacity of WWD3334 is 2,677 m^3/day/m. The available drawdown (including interference effects from the well field) was calculated to be 0.8 m, which equates to a maximum available flow of 24 L/sec. The maximum available drawdown calculated by Aqualinc was 18.3 L/sec.

However, even given the conservative nature of this approach, it is still showing potential effects on neighbouring bores, in particular with regards to bore WWD2116. Based on the calculations in Table 14 of Aqualinc (2007d), the

hydraulic characteristics of this bore are such that it is likely it could pump its peak allowable abstraction rate (6 L/s) as consented. However given the reduced water levels as a result of the proposed abstraction, this bore would no longer be able to abstract at this rate (i.e. maximum available flow reduced from 7.2 L/sec to 4.9 L/sec).

Using the specific capacity approach (calculated specific capacity of 438 m^3/day/m) the maximum available flow within WWD2116 would only be 4.5 L/sec (i.e. 438 m^3/day/m x 0.81 metres of available drawdown). This is still below the consented peak abstraction rate. The implications of this would be that in order for this bore to supply its maximum consented rate, it would need to be drilled deeper.

Paragraph 45 of Mr Weir's evidence outlines that the neighbouring bores within 1 km of the well field could experience a reduction in the maximum flow, particularly those bores which do not fully penetrate the aquifer. Section 30.1.14 of the Tasman Resource Management Plan allows for the protection of neighbouring bores provided they 'fully penetrate' the aquifer. Full penetration is considered to be to the bottom of the Motueka Gravel aquifer. It is acknowledged that all of the neighbouring bores are less than 12.4 metres, thus they are not likely to be fully penetrating as the base of the aquifer is located at approximately 20 metres at the well field location.

Interference effects were also determined for existing bores located across the Motueka-Riwaka Plains. There are many bores and specific information on their construction specifications is not available. As such an interference assessment was undertaken on generic not specific actual bores. This assessment involved determining the level of interference at set distances from the proposed well field.

In particular, this assessment focused on shallow bores that do not adequately penetrate the aquifer, as the maximum available drawdown within these bores is limited. Assumptions made during this assessment included - setting bore depths of 10 m to the east (area of shallower groundwater) and

12 m elsewhere, and the lowest groundwater level set based on the nearest Tasman District Council monitoring bore (e.g. Rossiters which is located within the specified 2,000 metre radius of the well field).This focused approach on generic bores as well as the assumptions used within this assessment is considered reasonable because it conforms to the known groundwater levels of the area.

The lack of specific information regarding the bores across the Plains, i.e. yield and drawdown, meant a specific capacity of each bore could not be determined. This information could have been used to determine the level of conservatism within the results as previously undertaken in paragraph 9.4 for the neighbouring bores. However, as the analysis is based on the transmissivity calculated for the deep aquifer, the fact that specific capacity of bores in the area is high (i.e. greater than 400 m^3/day/m), and the many conservative assumptions included within the assessment, the results of this assessment are considered appropriate.

Given the heterogeneity of the aquifer, SKM requested a sensitivity analysis be undertaken on the interference effects assessment as part of the Section 92 request dated 30 March 2007. The sensitivity analysis varied transmissivity, storativity, aquitard leakage and stream bed leakage and concluded that the calculations were most sensitive to values of transmissivity, while increasing or decreasing values of streambed leakance4 and storativity did not result in significant changes in the interference effects. This is not surprising as the transmissivity of the aquifer is high and hence horizontal flow within the aquifer is likely to dominate over vertical flow components including streambed leakance.

4 Streambed leakance is a parameter based on the vertical hydraulic conductivity and thickness of the streambed sediments. The hydraulic conductance of the streambed can then be calculated from this parameter if multiplied by the streambed width. Values of streambed conductance typically range from 0.1 – 5,000 m/day, with larger values corresponding to higher rates of discharge from the river to the groundwater. The streambed leakance of 27 day^{-1} within the Motueka River corresponds to a streambed conductance of 4,320 m/day (based on an assumed streambed width of 160 metres). This is consistent with the understanding that the Motueka River is the primary source of recharge of the aquifer system.

The streambed leakance value used within the original interference effects assessment was 27 day^{-1} which was based on the results of the testing completed on the deep aquifer. During the sensitivity analysis, the values of streambed leakance tested ranged between 13.5 day^{-1} and 40.5 day^{-1}.

A revised streambed leakance value of 3 day^{-1} was derived from the shallow aquifer testing (Aqualinc, 2007e). This revised value was considered by Aqualinc to be more representative than the leakance value calculated during the deep aquifer testing. However, the interference effects calculated for the neighbouring bores were not updated following the calculation of this new streambed leakance value. In a conceptual sense, the implication of a reduced leakance value is a reduction in water induced from the river during aquifer pumping, and proportionally more water sourced from aquifer storage. This would result in higher bore interference effects.

However, given the results of the sensitivity analysis (and with due consideration that the revised streambed leakage value is outside of the range of the sensitivity analysis), I consider that the calculated interference effects will not be greatly affected by the decrease in streambed leakance value.

It has been stated in paragraph 49 of Mr Weir's evidence (12 February 2010) that the existing domestic takes will have the opportunity to connect to the new water supply. However premised on the fact that there is no guarantee that people will connect to the new supply, the level of effects on these bores still needs to be considered.

An approach for mitigating any potential interference effects is to impose consent conditions regarding monitoring and a staged approach to development of additional abstraction bores. This consent condition approach matches the applicant's statement (paragraph 49 of Mr Weir's evidence, 10 February 2010), where it is indicated that the scheme may take many years to reach full capacity, hence the effects from the staged development of the well

field can be assessed at regular intervals prior to the commissioning of future stages.

Numerical Groundwater Modelling

Overview

As previously outlined in paragraph 5.5 of this evidence, the development of the Motueka-Riwaka groundwater model was undertaken to support the Council's investigation into the sustainable yield of the Central Plains zone of the Motueka-Riwaka Plains. This model has undergone several updates since it was first constructed in 1999, with the latest update outlined in Aqualinc (2008).

It is understood that a peer review of the modelling report was completed by Hugh Thorpe in May 2007. This review was completed on the model outlined in Aqualinc (2007c), rather than the latest version of the model discussed in Aqualinc (2008).

The changes made to the groundwater model in Aqualinc (2008) included revision of aquifer hydraulic parameters to improve the representation of the hydrogeology in the area (i.e. the number of hydraulic conductivity zones were increased from three to nine). The following sections provide commentary on the latest model and management scenario results.

Model Structure

The model incorporates three model layers representing the upper unconfined aquifer, overlying a leaky aquitard that in turn overlies a deeper semi-confined aquifer. This is consistent with the hydrogeological understanding the Mouteka-Riwaka Plains aquifer, and in particular is consistent with the borelogs of bores recently drilled at the proposed wellfield location, e.g. WWD2179. As such, this model layer definition is considered appropriate. It should be noted however that we have not been able to verify how the layers varied in thickness throughout the model domain. This is important because

the model calculates transmissibility in the lower layers from the hydraulic conductivity input to the model and built-in layer thickness.

A key observation is that the model is set up as a regional scale model with a consistent cell size of 450 by 450 metres. Further refinement in the 2008 model has not been undertaken around the proposed well field, which has meant that the model is not appropriate for simulating local effects.

Aquifer Hydraulic Properties

The hydraulic conductivity for the three layers were increased from three to nine zones to improve the representation of the aquifer system. Appendix A and Table 3-3 in Aqualinc (2008) outlines the location and hydraulic conductivity values used within the nine zones. There is no explanation as to how the specific zones were defined. The geological information provided within the application was outlined in Section 5.

The only aquifer test data reported within the modelling reports is from tests conducted by Aqualinc on the well field. No additional aquifer test data from across the region was provided, although detailed aquifer tests from bores distributed around the plains have been undertaken as stated in Paragraph 17 of Mr Thomas evidence. In the absence of aquifer test data, a modeller would use geological descriptions to weight the known test results for parameter assignment in areas without specific test data.

A review of the revised hydraulic parameters found several apparent discrepancies between the assigned hydraulic conductivity zones and hydrogeological information provided with the application. To aid in this discussion, Table 1 outlines the nine hydraulic conductivity zones within the model with the corresponding hydraulic conductivity value and geological description, while Figure 1 shows a schematic cross-section of the Motueka/Riwaka Plains aquifer.

Table 1. *Hydraulic conductivity (K) zones used within the groundwater model with corresponding geological description. Source: Aqualinc (2008).*

Zone & Layer [LX]	Horizontal K (Kx and Ky) (m/day)	Vertical K (Kz) (m/day)	Geology of Zone (information source provided in table footnote)
1 [L1,3]	5,500	0.001	Coarse – medium gravel in a medium sand matrix, with no coarse gravels occurring to the north of the Riwaka River[1]
2 [L1,3]	1,800	18	Course-medium gravel and cobbles in a medium coarse sand mix[1]
3	7,000	700	Course-

[L1,3]			medium gravel with an increase in clay and silt[1]
4 [L1]	100	1	Clay/silts in the vicinity of the Riwaka River[1]
5 [L1,2 & 3]	600	0.00001	Coarse-medium gravels with increased finer sediments[1]
6 [L2]	10	0.02	Aquitard consisting claybound gravels[1]
7 [L2]	1	0.06	Aquitard consisting of silty sand[2]
8 [L2]	5	0.01	Aquitard consisting of claybound gravels[1]
9 [L1 & L3]	3,400	40	Coarse-medium gravels in coarse sand mix. [1]

Geological information source: [1] information obtained from schematic cross section, [2] information obtained from WWD2179 borelog

An apparent discrepancy was identified with the zones assigned to the aquifers to south of the model, i.e. zones 3 and 9. The schematic cross-section, Figure 2-3 in Aqualinc (2008) in paragraph 5.4 of this evidence, indicates that there is an increase in clay and silt southwards (in the vicinity of Lower Moutere). Aqualinc (2007a) states that to the south, valley-floor gravels are mixed with material eroded off the surrounding hills and contain a significant quantity of fine sand, silts and clay. As such it would be expected that hydraulic conductivity in these zones would decrease to the south, when compared to the high permeability gravels associated with the Motueka River. However, Zone 3 has the highest hydraulic conductivity value assigned (i.e. 7,000 m/day), while Zone 9 has a high hydraulic conductivity of 3,500 m/day (compared to 1,800 m/day for Zone 2). An explanation for this might be that the model layers thin towards the south, but no data has been supplied to verify this.

In the only area where there is supposedly reliable test pumping data i.e. the well field (Zone 2), a hydraulic conductivity of 1,800 m/day has been applied in the model. The thickness of the deep aquifer at this location is approximately 8 m (based on the bore log for WWD2179), which equates to a transmissivity of 14,400 m^2/day. This is over twice the value of 6,200 m^2/day calculated from the aquifer tests (Aqualinc, 2007a).

Use of what would appear to be erroneously high hydraulic conductivity in this zone, further exacerbates the potential hydraulic conductivity issue in the south, which appears to be significantly out of step with the geological descriptions.

It has been stated the groundwater model is a regional representation of the aquifer and as such, local heterogeneity will be smoothed. However, it would be expected that the hydraulic parameters used within the model would closely reassemble the data available in the area of importance, i.e. the proposed well field.

The calculation of model transmissivity above is based on the known thickness of the aquifer within WWD2179, i.e. 8 metres. It is possible given the large grid

cells used within the model that the average thickness within this cell is smaller than 8 metres. However, as indicated above, no information regarding layer thickness has been provided within the modelling report (Aqualinc, 2008) so the actual transmissivity within the cell incorporating the well field could not be confirmed.

The implication of higher permeability within the model is that higher recharge is required to compensate in order to maintain measured groundwater levels, and less drawdown would be simulated than would occur in practice. This would then result in less seepage occurring from the river and would provide a higher simulated sustainable yield.

The groundwater model also has seven storage coefficient zones assigned, ranging from 0.06 to 0.0001. The storage coefficient within the deep aquifer was checked against the value calculated during the deep aquifer testing. The storage coefficient assigned to the deep aquifer was 0.0001 (Zone 7 in Table 3-4 in Aqualinc 2008). This compares well with the values of 0.00012 calculated from the aquifer testing. The justification for the storage coefficients assigned to the other six zones was not stated within the report, so further assessment of these parameters could not be undertaken.

Boundary Conditions

There are several boundary conditions included within the groundwater model that aid in the representation of the actual aquifer system. These boundaries are outlined and discussed below.

General head boundaries were assigned offset from the coastline in the model update outlined in Aqualinc (2007c). These boundaries remained unchanged in the latest model update in 2008. General head boundaries are the most realistic method for representing flow to the coast, particularly where assigned individually to each layer within a stratigraphic sequence to represent the progressive confinement with depth. This approach taken in Aqualinc (2008) assigned general head boundaries to only the top layer, but given their position off the coast, this is considered appropriate.

The rivers and any major non-spring fed rivers were represented using the Stream Flow Routing package with variable shaped cross sections included within the model to represent the bed of the river. The bed of the river was determined through measured cross sections. Inclusion of this specific information improves the representation of the groundwater-surface water interaction within the model.

One key point with this boundary condition would be the lack of cell refinement along the river boundary. The current grid refinement of 450 by 450 m means the head within the aquifer used to calculate flow between the stream and the aquifer will be an average over the area of the cell, i.e. the vertical head gradient within the model is very coarse. This may result in under or over estimation of the rate of water recharging the aquifer.

Drain cells were used to represent spring-fed stream and seep areas. This boundary is appropriate to use when representing groundwater discharge in a model.

Aqualinc have used their in-house soil-water balance software to calculate a time series of land surface recharge, i.e. recharge to the groundwater from rainfall. Aqualinc (2008) stated that the upgraded model was updated with 35 recharge zones. No information is provided in the report about the location of the recharge zones or the rate of recharge. As such, the appropriateness of the recharge zones and recharge rates could not be assessed. There is concern that the recharge coverages may have been needed to compensate for the higher hydraulic conductivity used in the model than what would appear to be reasonable. Again, this would give rise to less depressurisation effects and higher sustainable yields than available in practice.

Aqualinc have also used their soil-water balance software to calculate irrigation demand based on the landuse types outlined in Aqualinc (2007c). The resulting irrigation demand was not outlined in Aqualinc (2008) so an assessment on the irrigation demand could not be undertaken.

Model Calibration

The groundwater model was calibrated using data between the period 1 January 2001 to 1 July 2007 and verified for the period from 1 January 1995 to 31 December 2000. This is an improvement from the previous modelling where the model had only been calibrated and verified over three non-consecutive 24-month periods, i.e. calibration completed over the two-year period 1994-95, while verification was completed over two two-year periods, 1989-90 and 2000-01. The increased length of the model run enables long-term effects to be identified, particularly any increased effects due to the identified reduction in groundwater levels in the Central Plains area.

In determining whether or not a model calibration is acceptable (particularly when uncertainty exists in some of the input parameters), the following factors must be considered:

The ability of the model to match groundwater levels within long-term monitoring bores as well as any other groundwater level information available (i.e. aquifer test drawdown). It is particularly important within transient simulations that the model is simulating the trends and hydrological stresses occurring within the aquifer (e.g. reduction in groundwater levels over time, or the response to abstraction).

The ability of the model to simulate the various fluxes within the aquifer system, i.e. river leakage, spring discharge or flow to the coast.

The hydraulic parameters used within the model are within the reasonable bounds of known parameters (i.e. from aquifer testing) or typical published values based on the hydrogeology of the aquifer system.

The percentage of rainfall recharge to the aquifer is within the reasonable bounds based on known rainfall, hydrogeology, and landuse.

The model results from the Motueka-Riwaka groundwater model (Aqualinc, 2008) were assessed using in this review against the factors listed in paragraph 0 and my findings discussed below.

On face value, a good match was obtained between the observed and simulated heads in eight of the nine monitoring bores. In addition, all of the groundwater levels simulated the trends within the aquifer, e.g. the reduced water levels during drought conditions and the general trend of reducing groundwater levels within monitoring bores such as Rossiters as shown in Figure 2.

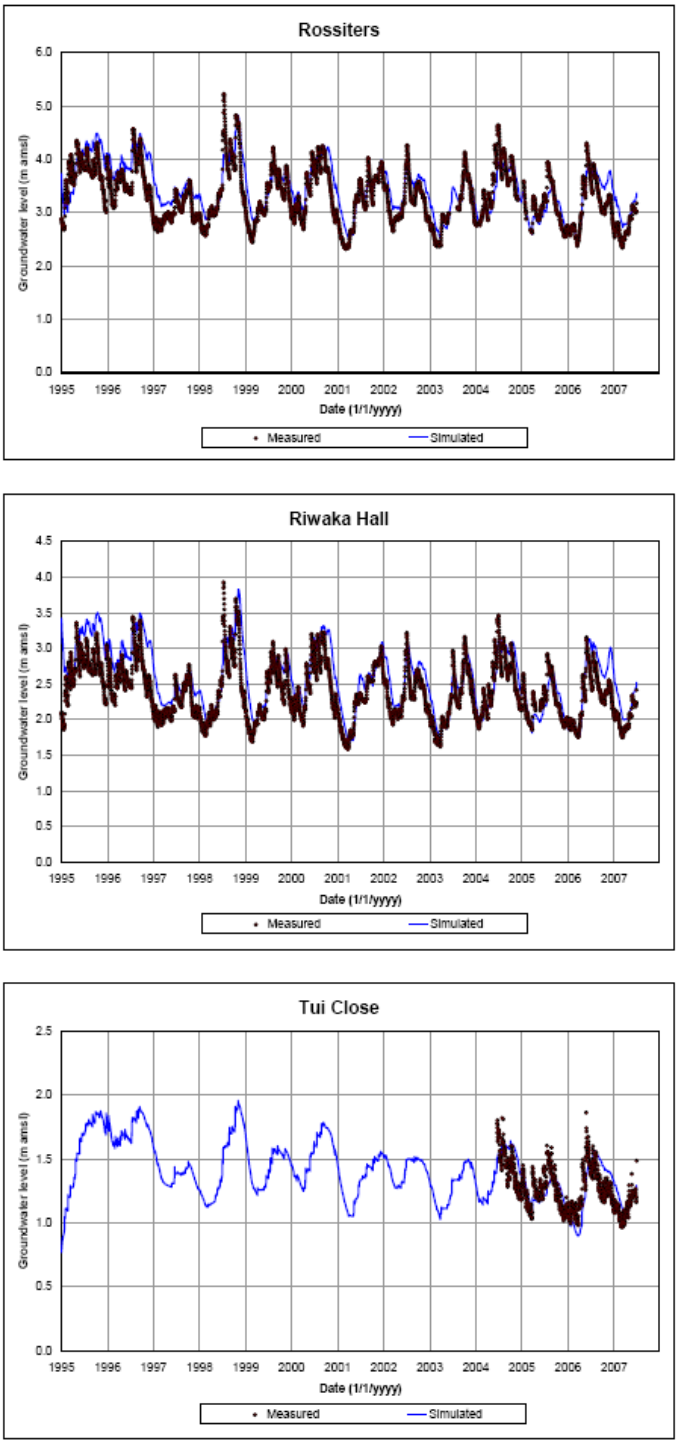

***Figure 2**: Measured and simulated groundwater levels for three of the nine monitoring bores (Source: Mr Weir's Evidence 10 February 2010).*

As previously stated in paragraph 10.5, it is recognised that the model is a regional representation of the aquifer system. However, calibration should be based on all available data in the area of interest. In this case, numerous constant rate tests have been completed by the applicant at the well field location with water level monitoring occurring in both the shallow and deep aquifers. These tests should have been used to verify that the hydraulic parameters for the aquitard are reasonable. This calibration step would require the model grid cells to be refined around the well field as well as a reduction in timesteps throughout the testing period.

I find it very unusual given the size and potential effects of this application (i.e. 20,000 m^3/day) that the model has not been refined in the well field area, and hence could then be used as a tool for both aquifer sustainability and a calibrated reliable cross-check on the analytical assessment of wider scale bore interference effects.

Information regarding the water balance of the model has been provided for the calibrated model for three different time periods:

average over calibration period;

first 90-days in 2001; and

first 90-days in 2006.

The water balance information for the first 90-days in 2001 is similar to the results of the previous groundwater modelling. For example, the river loss (i.e. river leakage) for the Motueka River was 1,338 L/sec in the previous model, while the updated model simulated a river loss of 1,331 L/sec.

This level of river loss is within the range of the observed river loss of 1,090 L/sec, which is based on 11 concurrent gauging runs on the lower reaches of the Motueka River between 1989 and 1994 (stated in Table 5-6 of Aqualinc 2007c). No additional river gauging information was available to confirm recent river loss. However, this confirms the findings of the streambed leakage values

derived from aquifer testing and from the conceptual understanding of the aquifer system, which is that the Motueka River is the primary source of recharge.

A review of the model flux with regards to spring flow was also undertaken. Figure 3-6 of Aqualinc (2008) indicates that there are two springs modelled within the zone budget area covering the Central Plains. SKM's Section 92 letter in March 2007 requested information regarding spring discharge in the area of the well field. A flow record for Thorpes Drain, a spring-fed drain, was provided. Thorpes Drain is located south of Old Wharf Road monitoring bore and so is assumed to be one of the springs modelled. Flow within this drain was recorded between 1989 and 1994 and indicated flows of between 100 and over 3,000 L/sec, with an average flow of approximately 1,000 L/sec.

The spring flow simulated from the Central Plains Zone over the calibrated model period was 1,002 L/sec, as shown in Figure 4-14 of Aqualinc (2008). This flow is within the range of flows measured within the Thorpes Drain. However, the flow from the other spring modelled within the Central Plains Zone is unknown so the overall accuracy of the simulated springflow cannot be concluded.

As discussed in paragraph 10.9, there is some uncertainty associated with the hydraulic conductivity values assigned to the model as they do not appear to confirm with the hydrogeological understanding of the aquifer nor the transmissivity values calculated from the aquifer testing conducted on the well field.

The rainfall recharge zones and rates (called land surface drainage within Aqualinc 2008) are not stated within the report, as previously outlined in paragraph0. However, a review of this information can be completed by comparing typical rainfall recharge estimates against the zone budget information from the model. This information is provided in Figures 14-4 to 14-6 in Aqualinc (2008).

The average annual rainfall is approximately 1,249 mm based on the rainfall record at Riwaka AWS (Agent Number 12429). Average annual rainfall recharge to gravels is generally considered to be in the order of 30% of the annual rainfall, given the permeable nature of the sediments. Summer recharge will be significantly lower, while winter recharge is generally significantly higher. Based on this, the rainfall recharge to the aquifer equates to approximately 374 mm/year (or 1.02 mm/day).

Figure 14-4 in Aqualinc (2008) indicates that the average rainfall recharge to the Central Plains Zone aquifer is 318 L/sec, which equates to 1.27 mm/day based on an area of 2,170 ha m^2. This indicates that the rainfall recharge being included within the model is approximately 37% of mean annual rainfall, which is higher than I would expect. This may explain the higher why higher hydraulic conductivities were utilised, as previously discussed in paragraph 0.

An overall water budget assessment indicates that the primary source of recharge to the model is from the Motueka River (63% of total model influx of 3,174 L/sec). As indicated in paragraph 0 the model appears to simulate river loses very accurately. The implication of this may well be that the model is not overly sensitive to the potential discrepancies in recharge identified above, however I have no information to assess this.

Overall, this review has identified a number of concerns with the model construction and calibration that I feel require further clarification during the hearing process to fully understand the uncertainty (or lack of uncertainty) in the model predictions.

Management Scenarios

Given the uncertainties raised in the model construction and calibration, this section reviews the Management Scenarios purely from the perspective of whether these scenarios are adequate for the range of issues under consideration.

The decision variable for the sustainable yield assessment was based on the effect of the increased abstraction on saltwater intrusion. This decision variable is considered appropriate given the hydrogeological nature of the area, i.e. thinning gravels towards the southern margins.

The 10 different development scenarios used in the latest modelling are outlined in Section 5.2 of Aqualinc (2008) are grouped into two categories:

Scenarios with water restrictions (35%) in the Hau Plains for drought years exceeding a 1 in 10 year event; and

Scenarios with water restrictions in the Hau Plains.

Each category included five different management scenarios, which are:

- ***Baseline: This scenario is based on the calibrated model but with additional irrigation from the Motueka River upstream of Woodman's Bend, all community water supplies are pumping continuously at their full allocation rates, and full irrigation within the model area.***
- ***Scenario 1: Baseline scenario plus an additional 20,000 m^3/day abstraction from the proposed well field.***
- ***Scenario 2: Scenario 1 plus an additional 10,000 m^3/day abstraction from 10 cells near the proposed well field.***
- ***Scenario 3: Scenario 1 plus an additional 20,000 m^3/day abstraction from 10 cells near the proposed well field.***
- ***Scenario 4: Baseline scenario with the Motueka River bed invert levels lowered by a maximum of 0.3 m (to simulate bed degradation).***

These management scenarios are considered appropriate as they assume further irrigation development upstream of Woodman's Bend and the Central Plains

and Umukuri Zones, as well as using the full allocation for community water supplies, and hence are conservative. In addition, a scenario was devised where the riverbed of the Motueka River was reduced by 0.3 m. This is consistent with previous riverbed surveys and the reduced bed levels are considered to have contributed to the reduction in long-term groundwater levels as shown in monitoring bores such as at Rossiters (see Figure 3 in Aqualinc 2007b).

The scenario categories were also appropriate as they considered possible mitigation measures, i.e. water restrictions of 35% imposed on all irrigation and industrial bores in the Hau Plains.

The decision variables were based on the subsurface groundwater flow to the sea and the coastal groundwater levels. These were considered appropriate variables from which the results of the Scenarios can be determined as they have direct relevance to the issue of saltwater intrusion.

Model Results

The uncertainty in the layer thicknesses, hydraulic parameters and recharge coverages in the groundwater model presents some uncertainty in how much faith can be placed in the results from the modelling scenarios. In this regard, this section provides some general comments, but no specific conclusions can be drawn about the appropriateness of the model simulations until clarity on some of the points raised above is provided and depending on this, some sensitivity runs of the model.

The conclusion from the latest updated model and scenarios as described above states "that to be conservative in managing the Motueka-Riwaka groundwater system, it is recommended that the additional volume of 24,500 m^3/day (as stated in paragraph 5.9) should be only made available from the area within the Central Plains zone" (page 72, Aqualinc 2008). This was based on a conservative groundwater level trigger set at 85% of the minimum groundwater level calculated by the calibrated model with the Hau Plains Restrictions in place.

This additional sustainable yield value of 24,500 m^3/day has reduced from the 33,000 m^3/day as previously calculated in Aqualinc (2007c). However, this additional sustainable yield value indicates that the proposed abstraction of 20,000 m^3/day is sustainable. The proposed consent conditions around the staging of well field development and monitoring of neighbouring water levels will provide protection against any adverse effects from occurring. In addition, it is recommended that the current monitoring undertaken to determine the presence of saltwater in the coastal monitoring wells be continued.

The effects of the proposed abstraction were assessed based on the potential effects on the Motukea River, spring flows and regional groundwater levels.

The results of the simulation indicate that the proposed abstraction shall increase leakagefrom the Motueka River to groundwater by an average of 28 L/sec (Table 6-7 Aqualinc 2008). This reduction in flow in the river equates to approximately only 0.3% of the 5 year (7 day) low flow (9,696 L/sec).

During a 1 in 24 year drought (during summer of 2001) the river losses from the proposed abstraction, in conjunction with the existing and proposed abstractions outlined in paragraph 10.43 are in the order of 1,351 L/sec. This reduction equates to approximately 14% of the 5 year (7 day) low flow (i.e. 9,696 L/sec). My gut feel is that sensitivity runs on the model might increase the percentage losses to around 20%.

The Tasman Regional Management Plan Policy 30.1.10 suggests an allocation limit from the river ranging from 10% to 33% of the 5 year (7 day) low flow, if instream values are low. No information on the instream values are outlined within the application. In the absence of information, the default position would be high instream values.

The proposed abstraction will have an effect on the natural discharge of groundwater to springs. Results of the modelling indicate that the proposed abstraction would reduce the spring flows by an annual average of 12% (based on the simulated spring discharge in the calibrated model) and 16% during the 1 in

24 year drought. Sensitivity runs on the model might increase the percentage losses to around 20%. Chapter 30 of the Tasman Regional Management Plan does not specifically make reference to an allocation limit for springs. Thus, it is considered that the allocation limit outlined in Policy 30.1.10, which refers to 5 year low flow for rivers (discussed in paragraph 10.53) should apply. The percentage reduction in combined spring flows as modelled by Aqualinc exceeds the Policy in the Plan.

The model scenarios also investigated the temporal and spatial effects on regional groundwater levels. The temporal effects were determined by assessing the reduction in groundwater levels within three of the long-term monitoring bores, i.e. Wratts, Rossiters and Tui Close, during the period of lowest groundwater levels (1 January 2006 to 1 July 2007). The level of effect on the groundwater levels for this review was determined by comparing the groundwater levels from the calibrated results and Scenario 1. As expected, the level of effect was dependent on the proximity of the monitoring well to the proposed well field, and ranged between negligible (Wratts, located upstream of proposed well field) and 0.5 m (Rossiters – the closest of the monitoring bores). This level of effect is not considered to be significant and the continuation of monitoring in this bores, in conjunction with the staged development of the well field, will enable an assessment of this level of effect to be closely monitored over time.

The spatial effects on the regional groundwater levels were assessed by comparing groundwater levels between the calibrated scenario and Scenario 1. The maximum reduction in groundwater levels is approximately 0.7 m at the well field location. It is difficult to confirm the accuracy of this assessment given the lack of refinement in this location as well as the uncertainties with the hydraulic parameters at this location. However, this level of drawdown is consistent with the maximum drawdown within a neighbouring bore as outlined in paragraph 9.2. In this regard, this assessment provides a useful cross check on the analytical interference effects calculated.

Conclusion

The methods used during aquifer testing, including data analysis, well field design and in determining well interference effects have been found to be appropriate.

Bore interference effects, while not tending to indicate a significant problem, nevertheless indicate some reduction in the ability of existing bore owners to continue to obtain the same rate of groundwater yield as currently obtained.

There is uncertainty in the layer thicknesses, hydraulic parameters and recharge coverages in the groundwater model. This uncertainty relates to an apparent higher hydraulic conductivity in the south of the model domain that appears supportable by the conceptual geological understanding. The potential implications of this are:

Under prediction of groundwater depressurisation;

Over prediction of sustainable yield;

Higher groundwater recharge required to maintain measured groundwater levels, hence over prediction of sustainable yield.

Further clarification, which is expected to come forthcoming during the hearing process, is required to fully understand the potential uncertainty in the model predictions.

Given the uncertainty in the model predictions, only general comments were provided on the results of the modelling. Specific conclusions could be drawn once clarification has been obtained and/or sensitivity analysis on the model parameters in question is undertaken.

The sustainable yield assessment indicates that an additional 24,500 m^3/day can be abstracted from the aquifer. This value has reduced from the 33,000 m^3/day simulated from the previous groundwater model.

An assessment of effects has been undertaken on the effect of the proposed abstraction on rivers and springs in the aquifer system. There are concerns regarding the level of effects simulated (12 to 16 % reduction in low flow) within the Motueka River and springs, particularly as the uncertainty in model parameters might increase the level of effect.

The temporal and spatial effects of the abstraction were also investigated. The modelled groundwater impacts did not appear to be significant and were consistent with the analytical analyses undertaken. However, the proposed condition of consent regarding the staged development of the well field will enable the level of groundwater decline to be closely monitored at each stage of development.

Recommendations

In order to mitigate any potential effects on neighbouring bore users, a consent condition should be placed on the consent which outlines a staged approach to development of the well field over time to manage potential compensation for water losses. In addition, a condition which requires monitoring in some of the neighbouring bores should be specified. In this way, the effect of the staged development of the well field can be assessed and compared with the calculated interference effects.

GILLIAN HOLMES
February 2010

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Policy analysis for Motueka Coastal Community Water Supply – TRMP as at March 2007 and as amended by Plan Change 13 and Variation 66

Reduced water body flows or levels

Objective 30.1.1

The maintenance, restoration and enhancement, where necessary, of water flows and levels in water bodies that are sufficient to:

(a) preserve their life-supporting capacity (the mauri of the water);

(b) protect their natural, intrinsic, cultural and spiritual values, including aquatic ecosystems, natural character, and fishery values including eel, trout and salmon habitat, and recreational and wildlife values; and

(c) maintain their ability to assimilate contaminants.

The assessment of the effect of the proposed take on the Motueka River contained in the application (p75) noted that an increase in the existing recharge of approximately 13% for a 1-in-24 year drought year would be induced by the proposed taking of groundwater for the MCCWS. This recharge equates to approximately 1% of the 1-day mean annual low flow of the Motueka River and will therefore have no more than minor effects on the life-supporting capacity, natural, intrinsic, recreational, fishery and wildlife values, and natural character. Effects on cultural and spiritual values have been assessed as part of Mitchell Research's report, which has been provided to the Hearing Committee. The proposed taking of groundwater is not expected to have any effect on the ability of the Motueka River to assimilate contaminants.

Water body management

Policy 30.1.1

To maintain and enhance the uses and values of rivers, aquifers, wetlands and lakes that may be adversely affected by reduced water flows or levels including:

(a) the uses and values of water bodies identified in Schedule 30.1, particularly the internationally, nationally and regionally significant uses and values of water bodies;

(b) the customary and traditional uses and values of iwi, including wāhi tapu, mahinga kai and other taonga, particularly in relation to sustaining the mauri of the water;

(c) the capacity of water bodies to dilute contaminants;

by taking into account the management objectives specified for each of the water bodies in Schedule 30.1.

The relevant management objectives as listed in Schedule 30.1 of the TRMP are outlined below, with an assessment of the application against each management objective.

<u>All groundwater</u>

- *Prevention of seawater intrusion*

  The 2007 consent application for the MCCWS concluded that the proposed take was expected to reduce groundwater levels at the coast by a few centimetres and groundwater flow by approximately 8%. This quantum of effects was not anticipated to be significant in terms of the overall aquifer system, but it was noted that there could be localised occurrences of saltwater intrusion in the Hau and Transition zones. The area

that could potentially be affected by saltwater intrusion was illustrated in Figure 7.7 of the application.

As part of the technical work associated with Variation 66 to the TRMP trigger values relating to saltwater intrusion were selected to allow calculation of the maximum sustainable abstraction from the aquifer possible without saltwater intrusion occurring. Trigger values of a 6% reduction in the average water level at the Fernwood monitoring bore, a 6% reduction in the average seaward flux of groundwater, and no occurrences of landward flux (i.e. saltwater intrusion) resulted in a maximum sustainable abstraction rate of 24,500 cubic metres of groundwater per day if water restrictions were imposed in the Hau Plains Zone when necessary. This is the allocation that was adopted by Council in Variation 66.

As the volume of groundwater sought for the MCCWS (20,000 cubic metres per day) is less than the allocation limit that has been determined by Council as being sustainable and unlikely to result in saltwater intrusion, the application is consistent with the management objective of preventing saltwater intrusion.

- *Maintenance of aquifer pressures (abstraction rates to match recharge rates)*
  In an aquifer such as the Motueka/Riwaka Plains Aquifer reference to aquifer pressures can be taken to mean aquifer levels, as the groundwater is not deep enough for a significant artesian head to be present. The reduction in local groundwater levels as a result of the proposed taking of groundwater for the MCCWS has been assessed in section 7.2 of the application, and is discussed in greater detail in relation to policies about effects on neighbouring bores below. The applicant has sought a volume of water that will allow the groundwater level at the coast to be maintained, in order to minimise as far as possible saltwater intrusion in the Hau Plains Zone.

- *Maintenance of contribution to river or spring flows*
  The aquifer at the proposed point of take for the MCCWS is recharged by the Motueka River, rather than contributing to river flows.

  The 2007 application for the MCCWS noted that, due to reductions in groundwater levels at the coast, the proposed take could result in a reduction in spring discharges of approximately 5%. This is well within the maximum allowable spring depletion level of 35% set in Policy 30.2.14 of the TRMP.

- *Protection of water supply needs of stock and domestic users (provided there is full penetration of any alluvial aquifer)*
  Full penetration of the aquifer is defined as construction of a bore to the bottom of an aquifer (in this case, up to 20m in depth) and in such a way that it draws water from the entire thickness of the aquifer. A fully penetrating bore will ensure that the yield of the

bore is not affected by the natural seasonal variation in water levels (which can be up to 2 – 3 metres). Technical work completed for the 2007 application (see for example page 57 of the application) showed that, after 30 days of pumping at the maximum proposed abstraction rate, the water level of bores 0.5km from the proposed take would be lowered by approximately 0.5m. At a distance of 1.5km a water level reduction of 0.2m would be anticipated. Effects on fully penetrating bores are therefore expected to be no more than minor, and granting the application would be consistent with the management objective.

- *Maintenance of water users' security of supply at an acceptable level*
  Policy 30.2.14 of the TRMP sets the minimum security of supply for abstractive water users at a 35% reduction of allocation during a 10-year drought. The allocation volume for the aquifer is set to reflect this. The technical work carried out at the time of the 2007 application had proved that an additional allocation of groundwater over and above the existing allocation limit was sustainable, and would therefore not affect security of supply. This technical work has been confirmed through Variation 66. Granting the application would therefore be consistent with the management objective.

Motueka Plains. Central Plains and King Edward Zones Aquifers

- *Maintenance of flows in coastal springs*
  See discussion under third management objective for all groundwater above.

- *Maintenance of flow to Hau Plains Zone Aquifer*
  The Central Plains Zone of the Motueka-Riwaka Plains Aquifer system contributes flow to the Hau Plains Zone, with the flow varying depending on seasonal conditions. The magnitude of this flow has been calculated through the groundwater modelling work undertaken as part of the application. The applicant's approach in preparing the application has been to ensure that any reduction in flow to the Hau Plains Zone is minimised, in order to ensure there is sufficient seaward flow to minimise occurrences of saltwater intrusion. While the current level of flow will be reduced as a result of the proposed taking of groundwater for the MCCWS, sufficient flow will be maintained to meet the overall objective of minimising saltwater intrusion.

- *Prevention of seawater intrusion*
  See discussion under first management objective for all groundwater above.

- *Maintenance of aquifer pressures*
  See discussion under second management objective for all groundwater above.

- *Protection of water supply needs of stock and domestic users*
  See discussion under fourth management objective for all groundwater above.

- *Maintenance of water users' security of supply at an acceptable level*
  See discussion under fifth management objective for all groundwater above.

All surface water bodies

- *Maintenance of minimum low flows for instream aquatic values including fisheries values*
  The recharge induced from the Motueka River as a result of the proposed MCCWS take is anticipated to increase by a volume equivalent to 1% of the 1-day mean annual low flow. There will therefore be no significant effects on low flows in the river, and the application is consistent with this management objective.

- *Protection of contact and non-contact recreational activities*
  The minor nature of the reduction in flows in the Motueka River means that there will be no adverse effects on contact and non-contact recreational activities in the river. The application is therefore consistent with the management objective.

- *Protection of landscape, cultural and spiritual values*
  The minor nature of the reduction in flows in the Motueka River means that there will be no adverse effects on landscape values. In this respect therefore, the application is consistent with the management objective. Effects on cultural and spiritual values have been assessed as part of Mitchell Research's report, which has been provided to the Hearing Committee. It is not within my area of expertise to comment on the effect of the application on cultural and spiritual values.

- *Maintenance of water users' security of supply at an acceptable level*
  The minor nature of the reduction in flows in the Motueka River that will potentially result from the MCCWS take means that there will be no adverse effects on the security of supply for water users abstracting from water the river.

- *Protection of supplies for stock and domestic users*
  The minor nature of the reduction in flows in the Motueka River that will potentially result from the MCCWS take means that there will be no adverse effects on stock and domestics water users abstracting water from the river.

Motueka River (excluding tributaries above Woodman's Bend)

- *Protection of instream values particularly trout and native fisheries values*
  See discussion under first management objective for all surface water above.

- *Protection of cultural, spiritual and landscape values*
  See discussion under third management objective for all surface water above.

- *Maintenance of river flows consistent with the Water Conservation (Motueka River) Order 2004*

The Water Conservation (Motueka River) Order 2004 (the WCO) protects waters in the Motueka River catchment in recognition of their outstanding characteristics and features. The lower extent of the WCO is the Shaggery River confluence. Of specific relevance to the MCCWS is the 1.5km stretch of the Motueka River upstream from the Shaggery River confluence to Woodman's Bend, because in that area the WCO and the recharge zone for the aquifers on the eastern side of the river overlap. As noted earlier, the Motueka River is the principal source of recharge for the groundwater systems under the Motueka Plains. The technical work for the MCCWS showed that the proposed take could potentially result in an approximately 1% reduction in the 1-day mean annual low flow in the Motueka River. Given that the proposed well field is sited 3km downstream from the Shaggery River confluence, a major portion of this additional recharge will come from the river downstream of the limit of the WCO. It is also relevant to note that one of the reasons for excluding the lower reaches of the Motueka River from the WCO, was the existing loss of flow from the river to groundwater in that area. Therefore, it is considered that the proposed water take will not conflict with the WCO and is therefore consistent with the management objective.

- *Maintenance of water users' security of supply at an acceptable level*
  See discussion under fourth management objective for all surface water above.

Overall therefore, the application is considered to be consistent with Policy 3.1.1.

Policy 30.1.4
To establish the sustainable yield of aquifers taking into account:
(a) depletion of aquifer yields;
(b) reduction of connected surface water flows, including coastal springs and wetlands;
(c) potential for compression of the aquifer;
(d) potential contamination of the aquifer by seawater intrusion;
(e) potential for excessive drawdown of groundwater levels;
(f) presence and significance of living organisms naturally occurring in the aquifer;
(g) effect of land use activities on recharge of the aquifer;

to avoid:
(i) long term aquifer depletion;
(ii) drying up of surface waters;
(iii) compression of the aquifer;
(iv) irreversible seawater contamination of the aquifer;
(v) over-allocation of water from the aquifer.

Through rules in the TRMP Tasman District Council has established a sustainable yield for the aquifer that the proposed MCCWS would access. This sustainable yield is outlined in Figure 31.1E under Rule 31.1.4, as discussed on p13 below.

Policy 30.1.5
To maintain minimum river flow regimes or groundwater levels by establishing trigger levels for initiating rationing regimes for water management zones (as shown on the planning maps).

Schedule 31.1C contains a schedule for use in determining conditions on resource consents for rationing and rostering. By Variation 66 the Te Matu Zone has been included in Schedule 31.1C, with the following triggers:

- 0.4 millisiemens per centimetre in coastal monitoring bores WWD2510 and WWD2629 (in order to detect seawater intrusion); and
- 5650 litres per second Motueka River flow at Woodmans Bend.

These are triggers for consultation. There is no trigger for a first rationing step and no minimum flow contained in Schedule 31.1C for the Te Matu Zone.

Policy 30.1.6
To ensure that the water allocation limits take into account effects of other activities and events on availability or yield of water, including:
(a) potential water yield reduction effects arising from land cover changes such as changes to tall vegetation or urbanisation;
(b) climate change including changes to drought frequency;
(c) effects of dams and other water augmentation or storage schemes;
(d) effects of gravel extraction.

A number of submitters raised concerns about the application to take groundwater for the MCCWS with respect to current and future climate change. Under Policy 30.1.6 Tasman District Council took both this and the effects of gravel extraction into account when preparing Variation 66. The allocation limit set is the most conservative one suggested from the technical work that was undertaken, and has been selected cognisant of the risks of climate change. The allocation limit has been set at a level that is sustainable in terms of water availability and yield and provides a margin of safety to take into account the effects of other activities and events.

Policy 30.1.6A
To adopt a water allocation limit for the groundwater of the Motueka Plains aquifers based on the sustainable yield of the aquifer that takes into account:
(a) impact of groundwater abstraction on flows in the Motueka River;
(b) the cumulative effects of takes in the Central Plains Zone on the potential for seawater intrusion, especially in the Hau Zone;
(c) potential for inducing additional recharge to the aquifers from the Motueka River by allowing greater rates of abstraction in the high yield area of the Central Plains Zone;
(d) irrigation needs of land in the Middle Motueka and Upper Motueka water management zones;
(e) desirable security of supply standards for abstractive water users;

(f) the potential for mitigating adverse effects of localised saltwater intrusion in the coastal margin of the Hau Zone, including through provision of alternative water supplies for existing users;

and to review the allocation limit if further monitoring and investigation confirms that the Hau Zone seawater intrusion trigger for rationing is not affected by water abstraction in the adjacent zones.

A review of the section 32 information in relation to Variation 66 shows that each of these matters was taken into account in the development of the allocation limit for the Te Matu Zone. It is worth noting that Policy 30.1.6A confirms that a conservative water allocation limit has been adopted in Variation 66, by its reference to a potential review of the water allocation limit if monitoring and investigation confirms that the Hau Zone trigger is not affected by the new water allocation limit. The volume of water sought for the proposed MCCWS is within the allocation limit set for the Te Matu Zone, and can therefore be considered to be sustainable.

Policy 30.1.6B

To ensure that water takes from the Central Plains Subzone [sic]5 *avoid, remedy, or mitigate adverse drawdown effects on other water users and to:*

(a) require bore testing, including step drawdown and constant discharge tests to assess localised drawdown and hydraulic characteristics; and

(b) ensure effects of takes from any single bore or collection of bores in the same bore field take into account well performance, yields, localised drawdown and long term yield of existing fully penetrating bores.

Drawdown effects on other water users were addressed in the application in section 7.2 (pages 56 – 67). It has been concluded that effects on neighbouring bores that are more than 1km away from the proposed wellfield will be minor. Within 1km of the proposed wellfield the drawdown on bores that fully penetrate the aquifer will have only a minor effect during periods of low groundwater level. Neighbouring bores that do not fully penetrate the aquifer resource could experience a reduction in ability to pump at desired rates during periods of low groundwater levels. All of these bores are located within the service area of the proposed MCCWS, so an alternative water source would be available to them. As discussed below, for these bores Policy 30.1.14 of the TRMP provides an exemption for them to be considered in terms of adverse effects, in recognition of the fact that they constructed in such a way that their access to water is already potentially restricted.

As noted in section 5.3.1 of the application (page 32) the applicant undertook step-discharge and constant-discharging testing to assess the local hydrogeology and therefore allow the localised drawdown and hydraulic characteristics of the aquifer in the vicinity of the proposed wellfield to be assessed.

Sections 5.3.3 – 5.3.6 of the application assess well performance, yields and interference within the proposed wellfield. As noted earlier, section 7.2 of the application outlines effects of the proposed take on neighbouring bores.

5 Note, reference should be to the Te Matu Zone.

The application is therefore considered to be consistent with the requirements of Policy 30.1.6B of the TRMP.

Water takes

Policy 30.1.7

To manage the allocation of water taken from water bodies so that the cumulative effect of water takes does not exceed;

(a) the stated flow or water level regime;

(b) any allocation limit for water takes for consumptive use for the water body;

(c) the sustainable yield of the aquifer;

provided that harvesting water during times of high flow may be considered, if adverse effects can be avoided, remedied, or mitigated.

The application for the proposed MCCWS and the technical information developed as part of Variation 66 has demonstrated that the volume of groundwater sought is within the sustainable yield of the aquifer. While the proposed take exceeded the volume available under the allocation limit for the Central Plains Zone at the time the application was made, it is within the new allocation limit that has been included in the TRMP by Variation 66. The application is therefore considered to be consistent with the requirements of Policy 30.1.7.

Policy 30.1.7(b) has been made more specific by Variation 66, in that reference to 'water takes for consumptive use' has been inserted into the policy. This increased specificity has no effect on the MCCWS application however.

Policy 30.1.8A

To ensure that the connections between groundwater and river flows are fully accounted for when setting and reviewing water allocation limits and minimum flow regimes, and when deciding on applications to take or divert water, in relation to both rivers and their connected groundwater systems.

Connection between groundwater and the Motueka River has been covered in detail in relation to Policy 30.1.1 above, and it is considered that any effect on the Motueka River as a result of the proposed take for the MCCWS will not be significant.

Policy 30.1.9

When assessing resource consent applications to take water, particularly those applications to take water from water bodies where no allocation limit has been established, to take into account actual and potential adverse effects, including cumulative adverse effects of the proposal in combination with any existing authorised takes, on:

(a) natural character of the water body and its margins;

(b) associated wetlands;

(c) cultural and spiritual, amenity and recreational values;

(d) other water users;

(e) water reserved for other users;

(f) hydrological regime of the water body;

(g) capacity to dilute contaminants;

(h) uses and values identified in Schedule 30.1;

(i) sustainable yield of an aquifer and the sustainable short and long term yield of a bore based on assessment of yields over five and 100 days.

There will be no adverse effects on the natural character of the groundwater of the Te Matu Zone as a result of the taking of water for the proposed MCCWS.

There are some wetland values in areas of coastal springs around the mouth of the Motueka River. While flow of water through the aquifer would be affected as a result of the proposed MCCWS, the coastal nature of wetland areas and the influence of tidal flows on them, means that any effects directly attributable to the taking of groundwater would be difficult to determine.

Effects on cultural and spiritual values have been assessed as part of Mitchell Research's report, which has been provided to the Hearing Committee. Because of the minor nature of effects on the Motueka River no adverse effects are anticipated on amenity and recreational values as a result of the proposed taking of groundwater.

Effects on other water users have been assessed in section 7.2 of the application, and have been covered in detail in the assessment of Policy 30.1.6B and 30.1.7 above.

Within the allocation limit outlined in the TRMP rules, water is reserved for Maori Perpetual Lease Land and for Community Supply. The application is for the volume of water reserved for the Motueka Coastal Tasman reticulation from the Te Matu Zone. The application does not seek any water that has been reserved for Maori Perpetual Lease Land.

The hydrological regime of the Motueka-Riwaka Plains aquifer system has been discussed in detail in section 4 of the application. Sections 7.3 and 7.4 of the application contain an assessment of the effects of the proposed taking of groundwater on an aquifer-wide scale. The modelling of the aquifer predicts that a lowering of water levels by an average of approximately 0.2m would occur as a result of the take. As this reduction is considerably less than the normal seasonal fluctuations of 2-3m, the proposed take is not expected to cause any significant adverse effects. Flow of water through the aquifer is anticipated to decrease by up to approximately 45 litres per second, which represents 8% of the total predicted flow through the aquifer. No adverse effects as a result of this reduction are anticipated.

The minor effects on a region-wide basis, and the fact that the proposed take is within what is considered by Tasman District Council to be a sustainable allocation limit for the aquifer, means that there are not expected to be any adverse effects on the capacity of the groundwater to assimilate contaminants.

The effects of the proposed take on the uses and values identified in Schedule 30.1 have been discussed in detail in relation to Policy 30.1.1 above.

The proposed take is within the sustainable yield of the aquifer as determined by Tasman District Council through the Variation 66 process. Section 5.3.7 summarises the sustainable long term pumping rates of the eight bores that are proposed to make up the wellfield, and confirms that the abstraction rates sought are sustainable.

Policy 30.1.14
To avoid excessive localised reductions in bore yields when considering applications to drill bores or applications to take groundwater from an existing bore (provided that in the case of alluvial aquifers, potentially affected neighbouring bores fully penetrate the aquifer), taking into account the:

(a) sustainable yield of the aquifer;
(b) depth to the aquifer;
(c) permeability of the aquifer;
(d) distance from other bores;
(e) costs of full penetration;
(f) effects on connected surface water bodies;
(g) other uses of the water;
(h) cumulative effects of water takes from bores, including:
    (i) potential adverse effects of water takes from any bore whether any take is permitted or otherwise;
    (ii) effects of takes from new bores on existing takes;
    (iii) effects of existing water takes on any new take from a bore; and
    (iv) risks for potential water users identified on any Council waiting list;

and declining an application for new bores where:

(i) bore setbacks and casing requirements for the Moutere Groundwater Zones are not met, except in exceptional circumstances.

Localised reductions in bore yields were considered as part of the preparation of the application and have been discussed above in relation to Policy 30.1.6B. For those bores that fully penetrate the aquifer, effects of the proposed taking of groundwater for the MCCWS are not anticipated to be any more than minor.

Policy 30.1.15
In times of low flows, to use rationing regimes, including rostering, as mechanisms to avoid, remedy or mitigate the adverse effects of water takes.

Triggers for consultation with respect to rationing and rostering are included in Schedule 31.1C of the TRMP for the Te Matu Zone. There are currently no minimum flows to be observed, nor defined rationing steps for the Te Matu Zone.

Efficient Use of Water
Policy 30.1.16A
Within the sustainable allocation limits, and subject to flow or level regimes established by the Plan, the Council will achieve or require efficient use of water through:

(a) ensuring allocations of water for abstraction are established efficiently by:
    (i) establishing security of supply standards for water takes; and
    (ii) in relation to takes for irrigation end-use, establishing application rates based on soil type and climate; and
    (iii) regular review of take permits to ensure bona fide water use
(b) enabling water to be used for the highest social or economic values by:
    (i) reserving water for future specified needs; and

(ii) encouraging the transfer of permits within the same water management zone to help meet demand for water

(c) ensuring that the technical means of using water are physically efficient through:

(i) encouraging the adoption of best practice water use technology and processes that reduce the amount of water wasted; and

(ii) the use of water meters.

In setting the allocation limits for the Central Plains Zone in the TRMP and the Te Matu Zone in Variation 66, Tasman District Council has established a general security of supply standard of a reduction in authorised use of 35% in a drought with a return period of one in ten years. Because of the need to avoid seawater intrusion in the Hau Plains Zone, water users in the Central Plains Zone and the Te Matu Zone typically have a higher security of supply than other water users in the district.

Water has been reserved in the Central Plains Zone in the TRMP and the Te Matu Zone in Variation 66 for community water supply. The volume of water sought by this application was outside the volume of water reserved under the TRMP for community water supply in 2007, but is the volume of water reserved for Motueka Coastal Tasman reticulation (from the Te Matu Zone) in Variation 66.

With respect to the other relevant matters listed in Policy 30.1.16A (regular consent reviews, adoption of best practice water use technology and processes, and use of water meters), it is anticipated that appropriate consent conditions will be imposed, and that the activity will therefore be consistent with the requirements of Policy 30.1.16A.

Allocation of fresh water between competing water users

Objective 30.2.0

To achieve equitable water allocation and efficient use of water by water users, while ensuring an acceptable security of supply for water users.

Achieving equitable water allocation and ensuring an acceptable security of supply are matters that Tasman District Council undertakes as part of its ongoing work on the TRMP. With respect to efficient use of water, section 8.3 of the application noted that rural water users on the proposed MCCWS will be provided with a rural restricted supply, and any other water above this volume will need to be provided by landowners through such measures as rainwater harvesting or on-site storage tanks. All urban supplies within the proposed MCCWS scheme area will be metered, and water users will be charged for the amount of water used. Proactive communication in times of drought about the need to conserve water and continuation of the existing maintenance regime will be used to conserve water and avoid wastage. Finally, the proposed MCCWS reticulation infrastructure will be constructed using high quality pipe materials and water losses from the system are therefore anticipated to be significantly lower than is experienced with existing systems.

The application is therefore considered to be consistent with the requirements of Objective 30.2.0.

Equitable Water Allocation

Policy 30.2.1

During times of low flow beyond the provisions of any rationing or rostering regime or when implementing a water shortage direction under Section 329 of the Act, Council will give priority to the following uses, whether they are authorised by a permit or through a rule in the Plan (in order of priority from highest to lowest) in requiring reduction or greater restrictions, including cessation for authorised takes:

(a) water for the maintenance of public health;

(b) prevention of significant long term or irreversible damage to the water resource or related ecosystems or specified significant instream values;

(c) water necessary for the maintenance of animal health;

(d) uses for which water is essential for the continued operation of a business, such as irrigation of horticultural crops or water essential to industrial activities;

and the following uses will not be authorised during such a drought:

(e) irrigation and other uses not associated with commercial production such as irrigation of amenity plantings;

(f) non-essential uses such as recreational use, e.g. swimming pools and car washing.

While not directly relevant to the application it is worth noting the relative priority assigned by the Council to water for the maintenance of public health, and that the construction and operation of the proposed MCCWS will better allow the Council to provide for the public health needs of its communities.

Policy 30.2.3

To recognise and provide for the existing and potential future water needs of communities by:

(a) taking into account the effects of future community growth on available or potentially available water supplies, within the limits of any applicable allocation limit, especially in the Waimea Water Management Zones, and the Hau, Marahau and Moutere Surface Water Zones when making decisions on resource consent applications for subdivision or Plan changes to zoning;
(b) assigning priority for available water to the water supply needs for the maintenance of public health during times of drought;
(c) reserving water within any allocation limit for future expected community growth;
(d) investigating and adopting, if appropriate, according to Policy 30.3.3, other options, including water augmentation, water use reduction, and water re-use and recycling, for ensuring water demand for future growth is able to be met.
(e) declining applications for subdivision or zoning change if sufficient reliable and potable water is not available;
(f) taking into account the potential effects of severe drought in the stated level of service objectives in the Council's asset management plan for water supply.

Consistent with Policy 30.2.3(c), the water sought for the proposed MCCWS is the volume that has been reserved for future expected community growth in Schedule 31.1D of the TRMP. It is assumed that the Council will assign priority to the water supply needs of the MCCWS to provide for public health and in the event of drought conditions, as outlined in Policy 30.2.3(b). By developing and constructing the proposed MCCWS, the public health needs of communities within the scheme area will better be able to be provided for.

Policy 30.2.5
To reserve water within the sustainable allocation limits of the water body for the following uses:
(a) irrigation needs in respect of Maori perpetual lease lands under perpetual leasehold terms (where Maori landowners are unable to directly influence authorised access to water for irrigable land through lease arrangements); and
(b) community water supply needs, taking into account expected demand until 2026, and to enable temporary use of the reserved water by other users until it is required for the reserved purpose.

As noted above in relation to Policy 30.2.3, the volume of water sought for the proposed MCCWS is the volume that has been reserved for the purpose of Motueka Coastal Tasman reticulation in Schedule 31.1D of the TRMP. The grant of this application will utilise the Schedule 31.1D reservation fully.

Policy 30.2.7
To regularly review rates of water use specified on water permits, including those that are deemed permits under Section 386 of the Act, to ensure that levels, flows, rates or standards established for any water body or management zone will be met.

The applicant anticipates that review conditions to allow an assessment of the proposed MCCWS take in terms of any water levels set for the Te Matu Zone would be included on any consent that was granted.

Policy 30.2.8

To set a common expiry date for water permits to take water in each water management zone, to ensure consistent and efficient management of resource.

Because of the nature of the investment involved, the applicant has requested a term of 35 years for the taking of groundwater for the proposed MCCWS. While this consent term will not match the common expiry date for the water management zone, it is important for the applicant to have as much certainty as possible in developing the water supply scheme.

Policy 30.2.9
When assessing any application to take, use, dam or divert water, to take into account:
(a) any provisions that may exist for the reservation of water;
(b) effects on other water users, including drawdown of groundwater in neighbouring bores;
(c) measures taken for water conservation and to ensure efficient water use;
(d) measures for monitoring water use;
(e) whether the applicant has reasonable access to water at the site where water is to be used;
(f) whether the applicant already has any existing permits that are not fully exercised;
...
(h) for any application to take water for community water supplies, the area to be serviced and relevant data used in predicting likely urban growth;
...
(k) whether there is a reasonable alternative supply from which water takes cause less significant adverse effects, including water storage options for that property.
(l) whether the activity significantly reduces the security of water supply to existing dams.

As noted earlier, the proposed taking of groundwater is for the volume of water currently reserved for community supply in the Te Matu Zone. Effects on other water users have been assessed in detail in section 7.2 of the application, as discussed earlier in this policy analysis. The applicant has a proactive programme of public education and leak detection in order to ensure that water is conserved and that it is used efficiently. The taking of groundwater will be monitored by water meters at the wellfield. The technical reports provided with the application, and summarised in the assessment of environmental effects, have demonstrated that access to the water needed for the MCCWS is available at the site for the proposed wellfield.

The applicant currently holds three water permits to take groundwater for the partial supply of Motueka township, which are fully exercised. Final decisions about the exact configuration of the proposed MCCWS have yet to be made, so at this time the applicant wishes to retain the ability to use the existing Motueka bores as part of the supply for the scheme.

The area to be serviced by the proposed MCCWS is described in section 2.1 of the application. Information on future growth and demand projections has been provided in section 3.5 of the application. Alternatives to the proposed wellfield are outlined in section 8 of the application. None of the alternatives can provide the volume of water or the reliability of supply that is available from the groundwater resource at the site of the proposed wellfield. The proposed taking of groundwater for the MCCWS will not reduce the reliability of supply to any existing dams.

Policy 30.2.10
To regularly review permits to ensure the allocation authorised by the permit reflects what is actually needed by:

(a) encouraging permit holders to relinquish permits or, if relevant, to transfer the point at which water is taken, and/or lease or permanently transfer permits wholly or in part to another person if the water allocated is no longer being used, except in over-allocated zones where the transfer is likely to lead to an increase in irrigated area or amount of water used; or
(b) reducing allocations to reflect bona fide use.

As discussed in relation to Policy 30.2.7 the applicant anticipates that review conditions will be imposed on any water permit granted, consistent with the requirements of Policy 30.2.10.

Policy 30.2.11
To require water meters to be used by water permit holders:
(a) to ensure compliance with permit allocations or allocation limits; or
(b) when there is full allocation of water in a zone; or
(c) when there is a need for water use data to assess effects of abstraction on a water resource or in relation to an allocation limit; or
(d) in any zone where there is a rationing trigger; or
(e) to require efficient use of water.

The applicant has proposed a condition regarding water metering at the proposed wellfield, consistent with the requirements of Policy 30.2.11.

Policy 30.2.14
To seek to maintain or establish a minimum security of supply for all abstractive water users by establishing allocation limits and trigger levels for rationing whereby, for all except community water supplies, a reduction in 35 percent of the allocated amount is expected during a 10-year drought for permits to take water from surface or ground water bodies during summer periods, and to adopt a higher security of supply where knowledge about cumulative effects of water abstraction on water bodies is not complete or where demand for water resources is lower.

Because of the need to ensure that saltwater intrusion in the Hau Plains Zone is minimised as far as possible, in developing Variation 66 the Council adopted an allocation limit and trigger levels that provide for a greater security of supply than that specified in Policy 30.2.14.

Policy 30.2.17
To promote, encourage and require, as appropriate, water conservation practices in the use of water through:
(a) water use practices which minimise losses of water;
(b) water use practices that use water more efficiently;
(c) encouraging water users to use less water;
(d) encouraging the re-use of water;
(e) requiring the storage of water for any new dwelling not connected to a reticulated water supply.

The measures adopted by the applicant in relation to water conservation practices and efficient use of water have been outlined earlier in relation to Policies 30.1.16A and 30.2.9.

Chapter 31: Rules for water takes, diversions, uses or damming

When the application was made for the proposed MCCWS in 2007, the activity was classified as a non-complying activity under Rule 31.1.6A. Rule 31.1.2 of the TRMP as at 29 January 2005 permits the taking of up to 10 cubic metres of water per day for any purpose, but this volume of water is insufficient for the needs of the proposed MCCWS.

For new takes of groundwater, Rule 31.1.4 of the TRMP as at 29 January 2005 classifies the activity as a controlled activity, subject to a number of standards and terms. In order to be a controlled activity any new take of groundwater must not, on its own, or in combination with other authorised takes, exceed the relevant allocation limit specified in Figure 31.1E. For the Motueka/Riwaka Plains Zone, Figure 31.1E reads as follows:

WATER MANAGEMENT ZONE	ALLOCATION LIMIT (litres per second)
Motueka/Riwaka Plains Zones	
Central Plains Zone	855
King Edwards	135
Umukuri - Groundwater - Brooklyn River	133 62
Swamp - Groundwater - Little Sydney River	73 31
Hau Plains	228 [subject to condition (c)(i)]
Riwaka - Groundwater - Surface Water	30 170

At the time the application was made for the proposed MCCWS, the existing allocation from the Central Plains Zone where the wellfield was proposed to be located, stood at 741.14 litres per second. Including the various amounts of water that had been reserved in Schedule 31.1D, it was estimated that the available allocation in the Central Plains Zone was 777.49 litres per second. The volume of water sought for the proposed MCCWS would therefore, in combination with the existing allocation, exceed the allocation limit set for the Central Plains Zone, and thus the application did not comply with Rule 31.1.4.

While Rule 31.1.6 of the TRMP as at 29 January 2005, classifies the taking of groundwater that does not comply with Rule 31.1.4 as a discretionary activity, the requirement to comply with set allocation limits has been replicated in Rule 31.1.6. The application could not therefore be considered as a discretionary activity.

Rule 31.1.6A states that:

'The taking, diversion or use of water that does not comply with the standards and terms of Rule 31.1.6 is a non-complying activity.'

For simplicity the applicant determined that it was most appropriate to apply for the whole volume of water sought as a non-complying activity, rather than applying for a portion of it (equivalent to the remaining available allocation in the Central Plains Zone) as a discretionary activity. The application for the water permit was therefore made under Rule 31.1.6A of the TRMP as at 29 January 2005.

As part of Variation 66, the *Motueka/Riwaka Plains Zones* section of Figure 31.1.E of Rule 31.1.4 was amended to read as follows:

WATER MANAGEMENT ZONE	ALLOCATION LIMIT (litres per second)	ALLOCATION LIMIT (m^3 per year)

Motueka/Riwaka Plains Zones		
Central Plains Zone	795	
Te Matu Zone	344	
King Edwards	135	
Umukuri - Groundwater - Brooklyn River	133 62	

WATER MANAGEMENT ZONE	ALLOCATION LIMIT (litres per second)	ALLOCATION LIMIT (m^3 per year)
Motueka/Riwaka Plains Zones		
Swamp - Groundwater - Little Sydney River	73 31	
Hau Plains	228 [subject to condition (c)(i)]	
Riwaka - Groundwater - Surface Water	30 170	

The amendment to Figure 31.1.E has resulted in the inclusion of a new water management zone (the Te Matu Zone) with a set allocation limit. In addition, the allocation limit for the Central Plains Zone has been altered to take account of the establishment of the Te Matu Zone.

The following standard and term was also added to Rule 31.1.4 as part of Variation 66:

(h) Where the water is to be taken and used for the purposes specified in Schedule 31.1D, the amount of water taken on its own or in combination with other takes reserved for that purpose does not exceed the relevant limit specified in that Schedule.

Variation 66 altered Table 2 of Schedule 31.1D as follows in relation to the *Central Plains Zones*:

TABLE 2 RESERVATION OF WATER: COMMUNITY SUPPLY					
Water Reticulation Scheme/Supply	**(A) Amount Currently Allocated**	**(B) Total Required (Calculated) in 2026**		**(C) Amount Reserved**	
	(l/sec)	**(l/sec)**	**m^3/day**	**(l/sec)**	**m^3/day**
Central Plains Zones					
Groundwater – Motueka Recreation Centre	40.5	55.54			
Groundwater – Fearons Bush Motueka	11.57				

Groundwater – Motueka Memorial Park	3.47				
Motueka Coastal Tasman reticulation (from the Te Matu Zone)	0	231		231	20,000
Braeburn/Hau Plains/Lower Moutere reticulation		6.25	540	6.25	540

As the volume of water sought for the proposed MCCWS has been reserved within Schedule 31.1D of the TRMP, and is available within the allocation limit for the Te Matu Zone, if the application was made now, the taking of groundwater would be a controlled activity under Rule 31.1.4.

Relevant objectives and policies for Motueka Coastal Community Water Supply – Motueka/Riwaka Plains Water Management Plan (January 1995)

The Proposed Tasman Resource Management Plan (the TRMP) is not yet operative. Under section 104(1)(b) of the Resource Management Act 1991 regard still needs to be had to the regional plan that is operative, that is, the Motueka/Riwaka Plains Water Management Plan 1995 (the MRPWMP).

Relevant objectives, policies and rules are outlined below. In general, the objectives and policies in the TRMP address the same matters, but in greater detail. If the application can be shown to be consistent with the objectives and policies of the TRMP then it can be considered to be consistent with the objectives and policies of the MRPWMP as well.

Specific comment is provided on Policy 5.2.4, as the policies contained in the TRMP are not as directive. Comment is also provided on the specific provisions of the relevant rule, although it should be noted that, , Rule 31.1.4 should be given the greatest weight in terms of the allocation limit that has been established for the Te Matu Zone because it is based on more up to date investigation and monitoring of sustainable allocation limits.

Plan Objectives

3.2.1 To protect domestic and stockwater supplies.

3.2.2 To provide for an acceptable security of supply for existing lawful water uses.

3.2.3 To achieve the equitable and efficient allocation of available water to users.

3.2.5 To protect the wild, scenic and natural characteristics of the rivers, streams and coastal waters and to enhance the fisheries and wildlife within the Motueka/Riwaka Plains.

General Policies

5.1.1 Where water permits are still being granted, Council will continue to allocate water on the basis of priority in time, except where:

(i) water has been reserved for identified needs; or

(ii) water is to be transferred from the zone in which it naturally occurs.

5.1.3 Council encourages water use efficiency by allocating no more water than is necessary for irrigation...or for any other purpose.

5.1.4 Council seeks to protect the minimum water supply needs of domestic and stockwater users, provided in the case of groundwater sources that the wells penetrate the full depth of the aquifer.

Water Allocation Policies

5.2.1 Council will seek to avoid excessive localised reductions in bore yields in all management zones.

5.2.2 Council will require water meters to be installed in a staged manner throughout the Motueka/Riwaka Plains Planning Area.

5.2.3 Council will introduce rationing where monitoring or trigger flows indicate such action as necessary.

5.2.4 Council will not grant any permit which is likely to result in a significant adverse impact on the important instream and Maori values of the Motueka or Riwaka Rivers or of the coastal springs on the plains.

The technical work undertaken as part of the application, and in developing Variation 66, has shown that the proposed taking of groundwater will induce some additional recharge of the aquifer from the Motueka River. However, the level of additional recharge would equate to approximately 1% of the 1-day mean annual low flow of the Motueka River, and is therefore not considered to have a significant adverse effect.

Because of the reduction in regional groundwater levels, there is likely to be some reduction in flow from the coastal springs in the Central Plains Zone. However, the volume of water sought for the proposed MCCWS has been based on ensuring that effects on the coastal springs are minimised to the greatest extent possible.

The application is therefore considered to be consistent with Policy 5.2.4.

5.2.5 Council will reserve sufficient groundwater and surface water within the Central Plains and King Edward Zones to meet all present and foreseeable future domestic, urban, and irrigation needs, including irrigation needs in respect of Maori reserved lands, within these zones, as well as certain community supply needs (excluding irrigation needs) outside these zones supplied by water from within the zones, during a 1-in-20 year drought.

5.3.1 Council will allocate water for transfer from the Central Plains and King Edward Zones during low flow periods, only when Council is satisfied that sufficient water remains to supply present and foreseeable future domestic, urban, and irrigation water needs, including irrigation needs in respect of Maori reserved lands, within those zones, and to supply certain community supply needs (excluding irrigation needs) outside these zones, during a 1-in-20 year drought.

Rules

6.2.4 The taking of groundwater and surface water from the Central Plains and King Edward Zones (excluding taking from the Brooklyn and Little Sydney streams and from dams and reservoirs), subject to the following standards and terms:

(a) Permits shall be granted for a period expiring on 31 May 2000. Where a permit is due to expire between 31 May 1998 and 31 May 2000, and the holder applies for a new

permit for the same activity, any new permit granted may be for a period expiring after 31 May 2000 at the discretion of the Council; and

This condition aims to achieve a common expiry date for water permits in the Central Plains Zone, and is analogous to Policy 30.2.8 of the TRMP. Because of the nature of the investment involved, the applicant has requested a term of 35 years for the taking of groundwater for the proposed MCCWS. While this consent term will not match the common expiry date for the water management zone, it is important for the applicant to have as much certainty as possible in developing the water supply scheme.

(b) Permits shall only be granted for bona fide usage subject to Rule 6.1.2 and where relevant, to Rules 6.1.3 and 6.1.4; and

The application has proved that the volume of water sought is necessary for future population growth within the proposed MCCWS scheme area. The water permit sought will therefore be for bona fide usage of water.

(c) The transfer of water from zones shall only be allowed to the extent that sufficient water remains within the zones during a 1-in-20 year drought to supply:
(i) present and foreseeable future domestic, urban, and irrigation water needs, including irrigation water needs in respect of Maori reserved lands, within the zones; and
(ii) community supply needs (excluding irrigation needs) outside the zones, subject to criterion (d) of this Rule;

The water allocation limits that have been set for the Te Matu and Central Plains Zones take into account present and foreseeable future water needs. The abstraction of water for the proposed MCCWS will provide for community water supply needs, and will not affect the reservation of water for Maori perpetual lease lands. The area of irrigable land in the Central Plains Zone that does not have water permits at this time has been assessed, and the volume of water still available within the allocation limit will allow this land to be irrigated at an appropriate rate.

and

(d) Water transferred or to be transferred from the zones for community supply needs outside the zones may only be reserved as provided for under criterion (c) where:
(i) the Council is satisfied that the transfer of water is both necessary and appropriate, having regard to the water supply options that are practicable and their adverse effects on the environment; and
(ii) approval for the transfer is sought before 28 November 2000;

The MRPWMP did not specifically reserve water for community supply in the Central Plains Zone. This condition therefore does not apply to the current application.