



Report **05.32**
Date 31 January 2005
File ENV/5/2/2

Committee **Environment**
Author **Andrew Jones, Groundwater Scientist**

Investigating the sustainable use of shallow groundwater on the Kapiti Coast

1. Purpose

To inform the Committee of the results of our Kapiti shallow groundwater investigation work.

2. Background

The shallow groundwater in the Raumati – Waikanae area is used extensively for garden irrigation. Since 1999 we have been investigating the shallow aquifer to confirm whether pumping for garden irrigation is sustainable in the long-term.

The investigation has involved increasing our monitoring capability and targeted investigations undertaken in conjunction with Victoria University of Wellington. The investigation has culminated in the development of a calibrated numerical model of shallow groundwater in the Raumati-Waikanae area.

3. Strategic context

Enough water for all, today and in the future; and healthy ecosystems, are two aims of our strategic plan. This work helps to achieve those aims by providing a sound scientific basis for the sustainable management of shallow groundwater on the Kapiti Coast.

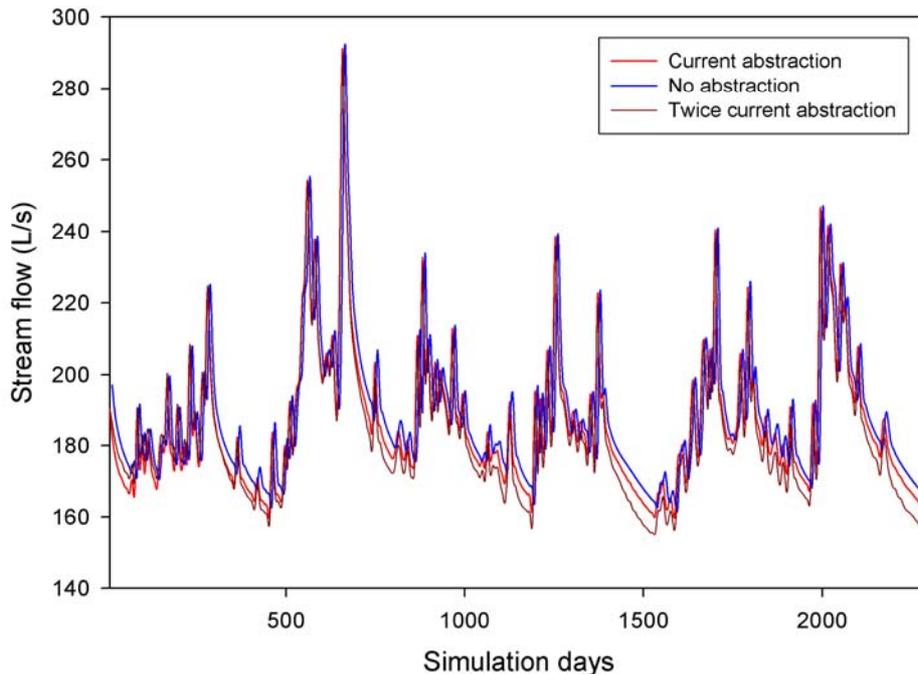
4. The modelling exercise

The numerical model encompasses the Raumati - Waikanae area and has allowed us to test the effect of shallow groundwater pumping on wetland water levels and spring flow.

The figure below shows the modelled flow in the spring-fed Waimeha Stream for three scenarios:

- No groundwater pumping
- The current estimated level of groundwater pumping
- Twice the current level of groundwater pumping, including pumping in areas not yet developed that might be expected to be built on in the future.

Waimeha Stream modelled interaction with shallow groundwater



The figure shows there is little difference in flow in the stream for the three scenarios; a similar result was found for wetland water levels. These results lead us to conclude that at a regional-scale, twice the current groundwater use for garden irrigation can be supported by the resource without any adverse environmental effects.

However, at a local-scale, wetland water levels and spring flow are sensitive to groundwater abstractions. To manage abstractions around springs and wetlands we recommend the adoption of buffer zones.

5. Managing groundwater abstractions around wetlands and springs

To manage groundwater abstractions in the Raumati - Waikanae area we propose that 150 metre buffer zones be defined around wetlands and springs. These zones would form the basis for two new regional rules within the Regional Freshwater Plan.

5.1 Proposed new rule 1

- Any groundwater abstraction greater than 20m³/day within a wetland buffer zone is a *non-complying activity*.

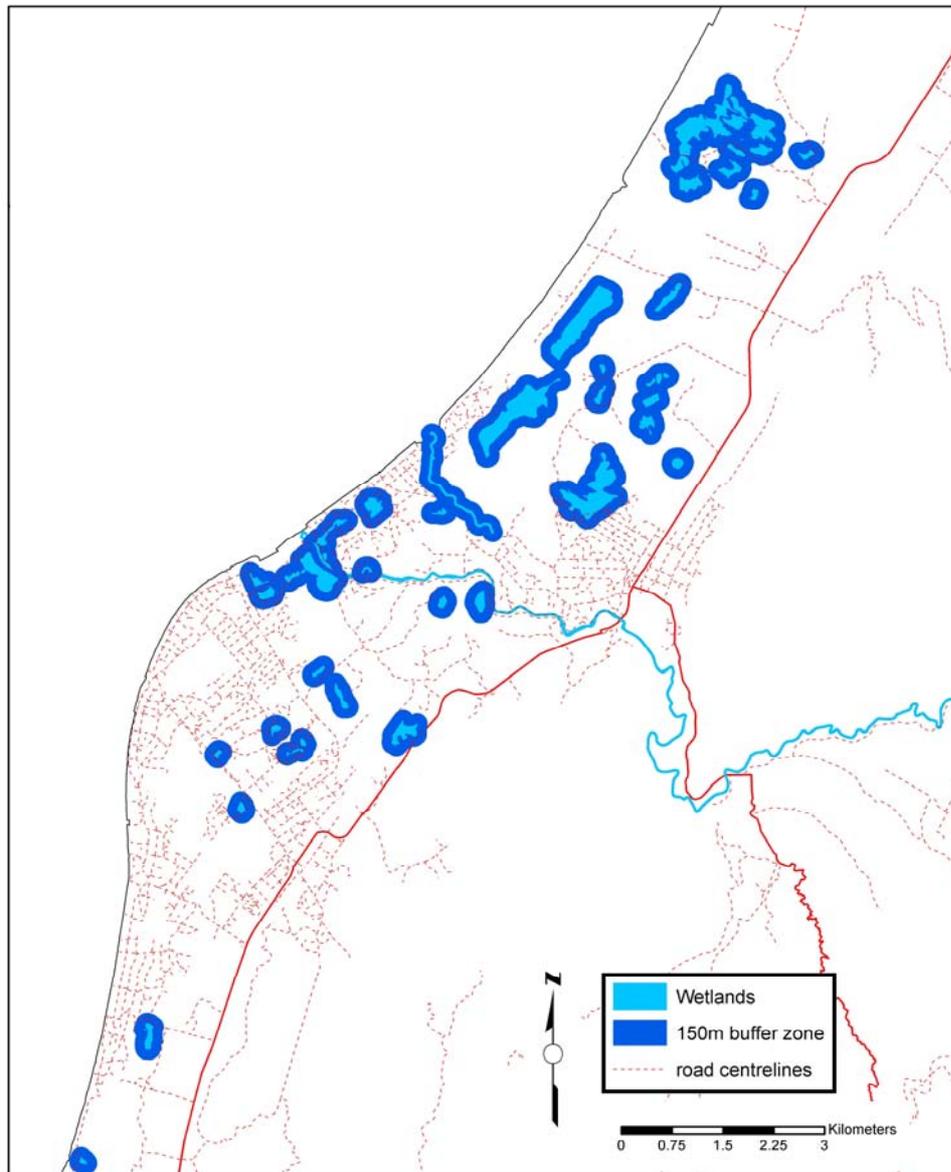
An abstraction of this size is currently considered as a *discretionary activity* under Rule 16 of the Regional Freshwater Plan. Changing the activity status to *non-complying* will ensure sufficient regard is given to the security of the wetland without precluding abstraction from deep aquifers.

5.2 Proposed new rule 2

- Any groundwater abstraction less than 20 m³/day within a wetland buffer zone is a *discretionary activity*.

Abstractions of this size are currently considered as *permitted activities* under Rule 7 of the Regional Freshwater Plan. Changing the status of such abstractions will allow us to control their number and location to ensure adverse effects on wetland water levels are avoided.

Shown below is a map of wetland and spring-fed streams with their proposed buffer zones.



Before the buffer zones are adopted it will be necessary to confirm the extent of the wetlands and spring-fed streams. This work is currently underway. With these areas accurately defined, the recommended rules may be incorporated into the Regional Freshwater Plan when the plan is next changed or reviewed. At that time the proposed rules will be subject to public consultation.

The model has also been used to assess the potential risk of sea water intrusion caused by widespread pumping for garden irrigation. Similar scenarios to those used for the Waimeha Stream were run to test the effect of pumping on coastal groundwater levels. The analysis shows that sea water intrusion is unlikely to occur, even at twice the current rate of pumping.

6. Future investigations

It is important to continue our shallow groundwater monitoring programme to establish long-term variation in water levels and spring flow. We intend to expand our wetland water level monitoring capability to confirm water level variation in key wetland areas in Waikanae and Te Horo. The Kapiti Coast District Council (KCDC) is providing financial assistance for equipment to monitor the Waikanae wetlands to help satisfy the monitoring conditions of their public water supply wellfield water permit. This monitoring work will help to achieve the goals and key actions of the *Wetland Action Plan* that was approved by Council in 2003.

Once we have established the seasonal variation in wetland water levels we should be able to define minimum levels for wetland health that will provide an environmental indicator for the Kapiti wetland areas.

Also, Victoria University are keen for students to continue targeted investigations with us. These investigations will be valuable for testing key assumptions used in the modelling exercise.

7. Communication

The KCDC has been advised of the study results. The study will allow the KCDC to confidently advocate the use of shallow groundwater as an alternative supply for garden irrigation water. Alternative supplies are important to reduce the demand on KCDC's public water supply system.

Te Ati Awa ki Whakarongotai have been informed of the study results as the work addresses their concern about the increasing number of shallow groundwater users.

The study report has also been sent to the Office of the Parliamentary Commissioner for the Environment (OPCE). In 2001 the OPCE published their report *Whose water is it? The sustainability of urban water systems on the Kapiti Coast*. In that report the OPCE raised concerns about Greater Wellington's lack of knowledge about the use of the shallow groundwater for garden irrigation. Our investigation addresses the OPCE's concern and complements work done by the KCDC to improve their public water supply infrastructure.

8. Recommendations

It is recommended that the Committee:

1. *receive the report; and*
2. *note the contents.*

Report prepared by:

Andrew Jones
Groundwater Scientist

Report approved by:

John Sherriff
Manager, Resource
Investigations

Report approved by:

Jane Bradbury
Divisional Manager,
Environment