

5. WATER USE, RESTRICTIONS AND FUTURE SUPPLY ISSUES RR 8299

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Corporate Plan Output: Supply of Water	

The purpose of this report is to advise of work carried out to improve the Council's preparedness for water restrictions should they become necessary this summer and to discuss means of preparing a water strategy for the Christchurch District which will allow the Council to have confidence that the water requirements of Christchurch can be met in the long term.

BACKGROUND

For the first time, water restrictions imposed in Christchurch in February 1998 resulted from concern with rapidly declining groundwater levels rather than whether or not the infrastructure could deliver the required demand. The restrictions highlighted a number of concerns which were covered in detail in a report by the Water Services Unit to the City Services Committee meeting in May 1998 and are summarised as follows:

- Although the Canterbury Regional Council gave the initial request for restraint through a press release, they did not follow this up with clear statements and made no direct request to industrial users.
- While consumers complied well with the restrictions the reduction in consumption taking weather conditions into account was not as marked as hoped for.
- The concentration of irrigation times created by the restricted hours put greater stress on the infrastructure which may have caused difficulties had warmer drier conditions prevailed during the restrictions
- Customer Services staff were unsure of their powers and ability to enforce restrictions.

Through the report to the May meeting, the Water Services Unit undertook to review procedures for initiating, implementing and enforcing restrictions and report back to this meeting.

Since May 1998, there have been several discussions with Canterbury Regional Council staff about both the short and long-term issues regarding Christchurch groundwater. In addition to looking at the city's response to short term issues that may require water restrictions, this report also discusses how progress could be made on long-term strategy and management issues.

TRIGGER LEVELS FOR RESTRICTIONS

The Canterbury Regional Council has undertaken to provide a clear set of trigger levels before this summer which, if exceeded, would require restraint by all groundwater users in the affected area. One indicator of the need for restrictions will be groundwater pressures at Woolston, to ensure these do not drop to a level that will risk downward seepage of low quality water from surface layers into the confined aquifer. Another indicator will be groundwater levels to the west of the city to ensure minimum flows in spring-fed streams.

We have requested the Regional Council to publicise these indicators and trigger levels so that the consumers can see and influence the effect their consumption has on aquifer pressures.

Woolston Area

Knowledge of how groundwater contamination has been occurring in the Woolston area has been given a significant boost over the past year by Ingrid Hertel who has completed a detailed investigation of the subject in conjunction with the Canterbury Regional Council as part of her MSc thesis. Concentrations of chlorides in this area have been increasing over the last 20 years or more and in some wells are already outside guideline levels of the Drinking Water Standards for New Zealand 1995. Ms Hertel's thesis suggests that downward leakage of estuarine water through the confining layer when aquifer pressures are reduced during periods of high abstraction is the dominant contaminant source.

The municipal supply takes 35 to 40% of the maximum daily take from the first aquifer in the Woolston area. Because contamination is already occurring even though total abstraction is only about 50% of that consented, it appears the resource in this area has been considerably over-allocated. The Regional Council is planning to establish a user-group in the Woolston area before summer to determine how demand will be reduced when required. This user group will include the Christchurch City Council together with some 13 commercial-industrial extractors.

INFRASTRUCTURAL CHANGES IN THE WOOLSTON/HEATHCOTE AREA

The city has four pump stations within the critical Woolston/Heathcote area: two in the "Rocky Point" zone at Tanners Street and Chapmans Road (former Heathcote County Council), and two in the central pressure zone, at Glenroy and St Johns Roads. Both wells at Chapmans Road show high chloride concentrations with one about 80% of the guideline values in the Drinking Water Standards for New Zealand, but pumping patterns are managed to ensure the mixed water is of acceptable quality.

Christchurch City, with its system of interconnected pump stations, has some flexibility in the medium/long-term as to where it draws its water. Provided the Water Services Unit has sufficient notice, this flexibility can be built (at a cost) into replacement of new infrastructure.

Fortunately, the Woolston groundwater study has coincided with the Council's plans to improve the supply east of the Ferrymead Bridge, for which \$300,000 has been allocated in this years budget. Recognising both the resource issues outlined above and the need to maintain pressures to serve both the Rocky Point and McCormacks Reservoirs, the following work is proposed:

	Estimated Cost
Mains upgrading to 300φ	150,000
New Booster Station	50,000
Aldwins Rd New Well	140,000
Isolate new Ferrymead pressure zone	-
Low flow control (valves or variable speed)	20,000
Total	\$360,000

\$60,000 of this work will come from the mains renewals budget, so the project can be completed within existing budget provisions this year and planning has begun with a view to operating the booster station this summer.

When this project is complete, the city would have a self-contained zone with three pump stations serving Woolston and all areas to the south-east. Municipal demand on the first aquifer in the Woolston area would be reduced by a third, and abstraction by all users from the same source would reduce by about 12%. That reduction is unlikely to eliminate the risk of contamination in future. Firm management of consents in the area by the Canterbury Regional Council will be essential to ensure that quality does not deteriorate further. This is discussed more generally later in the report.

WHEN SHOULD RESTRICTIONS BE APPLIED AND WHAT FORM SHOULD THEY TAKE?

The infrastructural changes outlined above should make an important contribution towards ensuring the need for restrictions is significantly reduced. Nevertheless, should a significant risk of environmental damage occur as a result of the volumes being abstracted, the Council in its own interest has to do what it can to manage demand.

The Regional Council has undertaken to advise trigger levels for Woolston before this summer. The Regional Council would advise all 13 consent holders in the Woolston area when the trigger levels were being approached and a users group would meet to consider where reductions could be made.

In the worst case, it would be appropriate to ban all irrigation apart from hand held watering cans, and to urge voluntary savings where possible in other ways. This is an extreme measure, but from experience last year lesser restrictions have a small effect in relation to the effort involved. It is envisaged that this measure would be used only in response to trigger levels being reached and if there was a real danger that failure to restrain demand would result in environmental damage. Intermediate trigger levels would initiate increased advertising and publicity regarding the dangers of further high demand.

In the past restrictions have been considered on a city-wide basis. In practice, the need for demand reductions will probably be confined to specific areas. A decision can be made at the time whether they should apply locally or to the whole system.

ENFORCEMENT AND LEGAL ISSUES

Officers from the Water Services Unit will be appointed, warranted and receive appropriate training at the start of the summer.

In the first instance, any reported violation would be dealt with by way of a warning. Repeated offences can be dealt with in one of three ways:

1. Prosecution
2. Injunction
3. Restriction of supply

1. **Prosecution**

Prosecution must be directed at the person rather than the property, so it is necessary to get either an admission or positive proof that the person being challenged is actually in control of the watering device.

2. **Injunction**

An injunction may be used in the case of a serious ongoing offence.

3. **Restrictions**

Restricting the supply is probably the most straightforward as far as the Council is concerned. A restrictor would be placed at the connection and would limit flows to levels that would be unsatisfactory for most sprinkler systems and cause inconvenience within the home, but allow sufficient flow to ensure public health can be maintained. Restrictors would be removed upon payment of a fee. It is expected that the use of restrictors would be a simpler and more effective deterrent than the threat of prosecution, but will lead to difficulties in situations when more than one household shares a meter. The ability to prosecute should therefore be retained as an option.

In order to clarify the Council's ability to restrict supply for non-compliance, section 23 of the Council's "Christchurch City Water Related Services Bylaw 1992" should be amended (with additions shown in bold normal type) as follows:

23. Disconnection and restriction of supply (for non-payment or non-compliance) ...
 2. The engineer or Water Supply Manager may stop or restrict the supply of water to any premises where a consumer:
 - (a) Fails to comply with a notice from the Engineer or Water Supply Manager requiring the repair of defective water supply pipes, distribution pipes or fittings; or
 - (b) Permits or suffers water to run to waste or be misused; or
 - (c) **Uses water contrary to a prohibition or restriction of supply that has been imposed under clause 19 of this bylaw.**
 3. Such supply will be restored only when the repair of the notified defects have been completed or a satisfactory undertaking as to the avoidance of future waste or misuse **or non-compliance** has been given and such reconnection fee as has been publicly notified by the Council has been paid.

CHRISTCHURCH DISTRICT WATER STRATEGY

Progress with Plans

In previous reports significant concern has been expressed about the Regional Council's lack of progress in determining agreed management strategies for the Christchurch-West Melton groundwater resource. The Council has repeatedly made submissions through the Regional Council's Annual Plan process seeking acceleration and completion of this work. Currently it is planned to be part of a **water chapter** of the region's Natural Resources Regional Plan, with an issues and options document of the water chapter due out this year. Our concerns remain that:

- Because the chapter addresses surface and groundwater over the entire region the detail we seek for Christchurch-West Melton may still not be there.
- A notified water chapter is still 2-3 years away and aspects remote from the Christchurch concerns could delay an operative plan for years after that.
- There are strategic issues that need to be addressed urgently that are not within the ambit of the Canterbury Regional Council's water chapter work. Examples include the restriction of industrial expansion over the unconfined aquifer and choices the community might make about water re-use or water efficient facilities.

Woolston Example

While contamination of groundwater at Woolston has been occurring for at least 20 years, the recent work by the Regional Council and Ingrid Hertel is the first verification that the contamination originates from leakage from estuarine water above and is related to abstraction rates. The work also indicates that the location of the seawater/freshwater interface is approximately 3 km offshore, and not 40km as deduced from models that assumed impermeable confining layers. This has important implications when considering the whether Christchurch's water requirements in the long term are sustainable from groundwater alone.

Recent Regional Council reporting of this contamination graphically emphasises the urgency for active management of the groundwater resource. This needs to include careful, deliberate and informed allocation of extraction consents, monitoring to ensure consents are not violated, rules to control extraction when trigger levels are reached, controls to ensure spring flows are maintained and providing early notice to users (10-20 years) that the resource cannot be further allocated.

In the Woolston case **existing** abstraction consents, if utilised, would double the estimated present take, yet the present extraction is capable of producing, and has produced, conditions favourable to movement of surface waters into the confined aquifer.

The Regional Council is now forced into the position of constraining demand amongst a group of users including the Christchurch City Council, which is operating well within legitimate consents. This is not good management. Other areas may also be over allocated, the effects only becoming apparent as extraction in the system as a whole puts more pressure on the resource.

While there is little alternative to restrictions to meet short-term shortfalls between supply and demand, the Water Services Unit contends that in the long term this form of management is unacceptable in all but infrequent climatic conditions (ie with a return period of 20-40 years). Waiting until problems are imminent and then using restrictions as the main method of management is unacceptable from an environmental viewpoint because there is a risk that the required reductions in water use will not be met, thereby putting the security of the resource at risk. It is also unacceptable from the city's viewpoint because the city and private industrial users are unable to plan for the future with any degree of certainty.

The Water Services Unit has serious reservations concerning the ability of regulatory processes alone and believes that an integrated strategic planning process is required to address all the issues involved.

Change in Direction

This year Water Services Unit officers have been meeting with Regional Council staff to emphasise our concerns and seek better progress. The talks commenced with a day-long workshop and a smaller group has continued to meet and tackle some of the matters discussed here.

The Water Services Unit has advocated a joint effort aimed at producing a Christchurch District Water Strategy and it is pleasing to report that agreement has been reached (at least at staff level) to pursue this course of action. This is a significant step since it will, if agreed by the two Councils:

- Focus effort on the Christchurch-West Melton area, recognising its importance both in terms of population served and the consequences of delayed management action
- Run in parallel with the water chapter work but without duplication
- Allow issues to be addressed that currently lie outside of the groundwater management concerns, including:
 - protection of water quality by restricting industrial land uses over the unconfined aquifers
 - enabling community discussion on options for alternative water sources
 - instruments for demand management (restrictions, efficiency, loss reduction, education and pricing)
 - maintenance of in-stream values

The Water Services Unit's recommended programme for this exercise is attached as an indication of the scope and timing of work. It will embrace all of the work currently being carried out by the Canterbury Regional Council in the groundwater system, but use a consultation process that will give attention to a much wider set of issues.

- Recommendation:**
1. That special order procedures be commenced to institute changes to the Christchurch City Water-Related Services Bylaw 1992 as set out in the body of this report.
 2. That water restrictions be imposed either when demand is placing stress on the city pumping and reticulation systems or when the Regional Council advises that specified aquifer pressures have fallen to pre-determined trigger levels.
 3. That **intermediate** trigger levels specified and publicised by the Regional Council be responded to with publicity, education and appeals for voluntary reduction.
 4. That Water Services Unit officers be authorised to pursue with the Regional Council a joint project focussed on the Christchurch-West Melton area with the objectives of addressing the key strategic water issues.
 5. That the Regional Council be requested, in addition to convening a users group of extractors in the Woolston area, to carry out a review of extraction consents in the area with the purpose of limiting future extraction to current levels.

6. That the Legal Services Manager report on the proposed use of restrictors and any implications for the Council in the event of a fire on properties where restrictors are installed.
7. That details of restrictions which may be imposed be reported to the September meeting of the Committee.

(Councillor Denis O'Rourke requested that his vote against this recommendation be recorded.)