

2 November 2007

Central Plains Water Trust
C/- Buddle Findlay
PO Box 332
CHRISTCHURCH

Attention: Rachel Dunningham

Dear Ms Dunningham

RE: RESOURCE CONSENT APPLICATIONS FOR THE CENTRAL PLAINS WATER ENHANCEMENT SCHEME: CRC061755 – CRC061983

Further to our recent discussion, here is the formal request for further information made under Section 92 of the RMA. I appreciate that given the suite of applications straddle both sides of the August 2005 amendment to the Act, only some of the information can be required and the remainder requested as per the 2005 amendment.

Some of the information listed below has previously been requested¹ and either not supplied or supplied only in part; and some of the information is sought because we are aware the information originally supplied is now out of date and commenting on the outdated information in the Officers Report serves no useful purpose.

From discussions between the experts, and in particular the meeting held on 4 October, I am aware that some of the information sought is readily available now. Unless we receive that information well before the hearing, the Commissioners will not have the benefit of our comments about reliability of that information. They have already signalled their intent to require applicant evidence and Officer Reports well in advance of the hearing.

As a general comment, it is difficult for us to determine from the information provided precisely what mitigation measures are proposed. While many measures are discussed, few are described in a way that allows reliance to be placed on them actually forming part of the proposal, with the consequence that we cannot be sure whether the effects being considered are residual effects or effects without any mitigation. Further comment on mitigation is contained within each of the sections dealing with specific effects.

1. Effects on groundwater quality

When comparing the nitrogen loading rates and soil water drainage rates used in the June 2007 groundwater quality model (report by URS dated 22 June 2007, titled "Central Plains Water Ltd - Nitrate Contamination Assessment"), I have found that the nitrate nitrogen concentrations in the soil drainage water are not consistent with values published in scientific

¹ 27 January 2006, 16 October 2006, 2 March 2007 and 16 May 2007

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Your Ref:
Contact: Angela Dean

literature. Please justify the inputs used in Nitrate Contamination Assessment and address the uncertainty in the drainage concentrations.

In a related issue, the nitrogen loading rates and soil water drainage rates area given very narrow distributions in the statistical analysis that is presented in the June 2007 report (Appendix A). Scientific literature suggests a much higher degree of variability in these inputs than what is suggested by the narrow distributions used in the report. Broader distributions could result in significantly different results from the modeling. Please justify the distributions used in Appendix A of the Nitrate Contamination Assessment.

2. Effects on groundwater quantity

I note there is considerable reliance on the results of modeling. We are aware further work has been completed in regards to groundwater modelling including a review of model reliability by Dr Noel Merrick. Could you please provide a copy of the external audit of the Aqualinc groundwater flow model undertaken by Dr Merrick, together with details of his terms of reference and description of material reviewed?

Could you also provide full details of the updated groundwater flow modeling undertaken. The "Preliminary CPWES Groundwater Model Report" which was supplied 22 July 2007 was completed prior to the completion of the transient model run and is incomplete.

Effects on groundwater recharge from reduced river flow

It is understood that reduced groundwater recharge due to reduced mean and median flows in the Waimakariri Rivers has been represented by the Aqualinc modelling, but no details have been reported. Please provide details of the effects identified for the Selwyn-Waimakariri, and Christchurch - West Melton Groundwater Allocation Zones and details of mitigation against any effects identified.

Effects on groundwater levels from mounding

Please provide a transient simulation of the timing, magnitude and distribution of mounding on groundwater levels within and down-gradient of the scheme area as far southeast as Lake Ellesmere. Detail should include a detailed risk assessment of the distribution and likelihood of flooding.

Effects on drainage networks, septic and stormwater disposal systems

Please provide proposals for monitoring and mitigation for any adverse mounding effects on soil, on the existing natural and man-made drainage network, on the operation of septic tanks and stormwater disposal systems, especially those within heavier soils in the area fringing Lake Ellesmere.

Effects on groundwater levels at Waianiwaniwa Dam

Please provide an assessment of the change in groundwater conditions and slope stability in the vicinity of the dam and impoundment.

3. Effects on terrestrial ecology and wetlands

Effects of works in the river bed on terrestrial ecology and wetlands

Please provide an assessment of the effects of the works in the riverbed of both the Rakaia and Waimakariri Rivers on terrestrial ecology and wetlands. This assessment should identify the significant indigenous vegetation and wildlife habitats on the Waimakariri and Rakaia river beds that may be affected by the proposed works, the native plant and animal species these habitats support and the size of their populations.

Please provide an assessment of the effects from the proposed works on these habitats and the species they support and provide mitigation including habitat restoration management plans to mitigate these effects. Please include specific concept designs, methodologies and timelines for mitigation measures and specify who will be responsible for ongoing maintenance work, and monitoring the effectiveness of the mitigation. Please also consider a response strategy in the event that monitoring shows mitigation objectives are not being met.

Effects of water take on terrestrial ecology and wetlands

Please provide an assessment of the potential ecological effects on the quality of feeding habitat for braided river birds consequent upon changes to instream ecology, and the potential effects of the proposed water takes on riparian wetland habitats of the Waimakariri and Rakaia Rivers.

Please provide mitigation including habitat restoration management plans to mitigate these effects. Please include specific concept designs, methodologies and timelines for mitigation measures and specify who will be responsible for ongoing maintenance work, and monitoring the effectiveness of the mitigation. Please also consider a response strategy in the event that monitoring shows mitigation objectives are not being met.

Effects of water use on terrestrial ecology and wetlands

Please provide an assessment of the effects of the water use on terrestrial ecology and wetlands. This assessment should identify:

- The potential effects on remnant indigenous dryland vegetation and habitats, resulting from increased surface flows and groundwater.
- The effects of increased surface flows and groundwater on the salinity of Lake Ellesmere and how will this affect lake shore vegetation and wildlife habitats
- The effects on lake shore vegetation and wildlife habitat resulting from increased surface and groundwater flows and elevated water nutrient levels
- The extent to which predicted changes to quantity and quality of lake inflows benefit indigenous vegetation and habitats over exotic plant species
- The effects on avifauna from a change in instream ecology from predicted nutrient increase in surface flows and groundwater.

Please provide mitigation including habitat restoration management plans to mitigate these effects. Please include specific concept designs, methodologies and timelines for mitigation measures and specify who will be responsible for ongoing maintenance work, and monitoring the effectiveness of the mitigation. Please also consider a response strategy in the event that monitoring shows mitigation objectives are not being met.

4. Effects on surface water quantity

Mitigation against effects from freshes

The effects of the abstraction of water from the Waimakariri and Rakaia Rivers on freshes has been highlighted in Kingett Mitchell reports (dated December 2006 and March 2007), however no mitigation measures have been provided to protect these. Please provide mitigation measures to reduce the effects of the takes on freshes in both the Waimakariri and the Rakaia Rivers.

Effects on other water users

The Kingett Mitchell report “Effects of Water Abstraction on the Waimakariri River” submitted in December 2006 did not assess the impact on A permit users from the Waimakariri River. I understand further work is being carried out with regards to this effect. Please provide an assessment of the impact on A permit water users from the Waimakariri River.

Effects on river from reduced river flow

A build up of fine material in the tidal reaches of the Waimakariri and Rakaia Rivers may affect the ability for early flood waters to 'blow' open the mouth, causing flooding of low-lying areas, for example the Rakaia Huts.

Please provide an assessment of the effects from reduced mean and median flows on sediment transport within both the Rakaia and the Waimakariri Rivers, and how this will impact on the riverbed, mouth and tidal reaches.

Effects from increased flows in lowland streams.

More information is required regarding the predicted increased flows in the lowland streams. Modelling has given some figures regarding the increases to some streams but no information has been provided to predict the length of time and frequency of increased flows. Please provide information to predict the length of time and frequency of increased flows in lowland streams and the effects of the increased flow on Lake Ellesmere.

Effects on water levels in Lake Ellesmere

Increased flows into Lake Ellesmere as a result of bywash discharges from the distribution network, and recharge to groundwater may potentially impact water levels in Lake Ellesmere, and consequently the water level management regime. Please provide further assessment on the scale of effects and how these effects, including increased costs associated with openings, will be mitigated.

5. Effects on surface water quality

Effect of use of water on surface water quality

Please provide details and an assessment of the mitigation proposed to address the adverse effects of increased nitrogen loadings to Lake Ellesmere/Te Waihora and lowland streams.

The possibility of water quality degradation occurring in the Waianiwaniwa reservoir has been highlighted in both Kingett Mitchell Reports (December 2006 and March 2007) but no mitigation measures have been proposed. Please provide explicit mitigation measures to reduce the likelihood of reduction in water quality of water stored and subsequently released from the Waianiwaniwa reservoir.

Please provide an assessment of the impact of all cumulative (A and B) takes from the Waimakariri River on assimilation capacity of lower river for authorised waste discharges (PPCS), and non-point discharges. Please provide information on the implications on water quality of the authorised and cumulative abstractions, and provide mitigation to address these effects.

Effects on river ecology

The applicant considers there are no issues given abstractions occur within the existing plan/order provisions, yet provisions did not anticipate such scales of abstraction, therefore this does not automatically mean there will be no effects. The possibility of effects occurring is realistic, and such effects should be identified.

Please provide an assessment of the effects of the takes on river ecology in both the

Waimakariri and the Rakaia Rivers. Please provide explicit mitigation measures to reduce these effects.

Effects on mudfish

The possibility of an effect on mudfish populations has been highlighted in both Kingett Mitchell Reports (December 2006 and March 2007), however no mitigation measures have been proposed. Please provide mitigation to reduce the effect of dam formation on the extensive mudfish populations of the Waianiwi catchment.

Effects on tidal reaches

A build up of fine material in the tidal reaches of the Waimakariri and Rakaia Rivers may affect the riverbed, mouth and tidal reaches.

Please provide an assessment of the effects from reduced mean and median flows on sediment transport within both the Rakaia and the Waimakariri Rivers, and how this will impact river ecology and ecology of tidal reaches, including Rakaia lagoon and Brooklands lagoon.

Fish screen design

There remains insufficient information on the methods and level of fish screening proposed from both the Rakaia and Waimakariri Rivers. More information is required regarding either the level of protection the screens will provide, or objectives of the screening and how these might fit in with other mitigation (i.e. reservoir mudfish populations).

If any new material is provided, it should be confirmed by the applicant that this new work replaces the earlier modelling and information provided in the original AEE and subsequent reports.

Please respond to this request by 5 p.m. 23 November 2007.

Please note that you have the right to object to this request for further information, in accordance with Section 357 (A) Resource Management Act 1991.

Yours sincerely

Leo Fietje
PRINCIPAL CONSENTS ADVISOR