

*Submissions and further submissions in relation to 'proposed Variation 2' – Hinds Plains to the proposed Canterbury Land and Water Regional Plan.*

**Supplementary note from Ian Mackenzie**  
**Eiffelton Community Group Irrigation Scheme**

**Clarification/correction to answer to question**

On reviewing the audio-transcript on the Environment Canterbury website I note that Commissioner Sheppard asked me a series of questions that related to matters that included the use of managed aquifer re-charge, targeted stream augmentation, nitrate losses and the use of a flexibility cap.

In particular, in the "*Early afternoon*" (17 June) transcript, Commissioner Sheppard asked me a question relating to the loss of nutrients from land to the drains within the Eiffelton Community Group Irrigation Scheme (the *Eiffelton Scheme*). He also asked a further question around the extent to which Variation 2 (and the aspects being sought by the Eiffelton Scheme) met the various obligations placed on the Council under the National Policy Statement for Freshwater Management 2014 (*NPS*).

In my answers I focused on (in particular) the loss of nitrates to the drains and waterbodies that provide water to the wider drainage network. On reflection I regretfully advise that I am concerned that some of my comments in respect of drainage system may be potentially misleading or incorrect in the context of the Eiffelton Scheme's position on wider Variation 2 and the NPS.

I am understandably concerned to ensure the Hearing Panel has the best and correct information in front of it when it enters its deliberations (and a correct understanding of the issues).

In this regard, I apologise to the Hearing Panel if they have already recognised the shortcomings in my answers, but in terms of wider clarification I note:

1. The tile drains that are located within the Eiffelton Scheme predominantly capture water coming up from underneath (i.e. ground water under pressure from aquifer recharge up-gradient). This water is typically high in nutrients given the landuse activities that are occurring in the upper catchment (i.e. the high nutrient load is not connected to activities in the lower catchment);

2. The groundwater within the Eiffelton Scheme area and wider lower catchment area (again, originating up-gradient) only comes to the surface in our paddocks where the subsoil clays are thinner or fractured allowing the water pressure to force water up through the soils. The tile drains in the Ashburton Hinds drainage district are laid in a random manner to capture water from those particular spots (rather than a grid) where the subsurface clays are too weak to withstand the upward pressure of the ground water;
3. In high rainfall events groundwater pressures respond quite quickly (see the hydrographs in my earlier evidence) and when these rain events occur:
  - a. it is not uncommon for the soils to reach saturation. Should percolation of water down through the clays occur it likely to be low volume and the high iron content in our clays is likely to result in very high attenuation of nitrates; but
  - b. in high rainfall water may also flow off the paddocks and into the surface side cut drains. In these circumstances there **is** drainage from our paddocks and it is likely that this drainage will contain nutrient loss to some limited degree depending on time of year and residual nitrogen status of the soil.
4. In the event that there is surface water drainage into the drainage network, these events tend to coincide with periods of high flow in the main stem drains and so these nutrients along with any sediment are conveyed by the drains to the beach very rapidly. In this regard, in such events the drains are left with clean shingle bottoms free of sediment and weed, and in my view such rainfall is not the source of nutrient loading that is causing concern in terms of aquatic habitat.

On the above basis, the Hearing Panel is hopefully clearer on the nature of the issues associated with the drainage district and the Eiffelton's Scheme's position on the NPS. In very simple terms, the extent to which the NPS is being met **is** important in the lower catchment – although any improvement will only be achieved with improvements in the upper-catchment.

Changes in lower-catchment land use activity (or matters such as nitrogen loss reductions) will not, in the Eiffelton Scheme's experience have a material impact on water quality in the lower catchment.

Ian Mackenzie

Chairman Eiffelton Community Group Irrigation Scheme  
6 July 2015