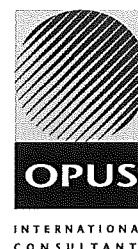


13 May 2008

Mr John O'Connor  
Utilities Engineer  
Mackenzie District Council  
PO Box 52  
FAIRLIE



3CW494.00

Dear John

## TWIZEL WATER SUPPLY PROTECTION AREA

The purpose of this letter is to respond to a submission received by Council relating to the proposed change to the Twizel Water Supply Protection Zone, and to comment on your Memorandum (ref. WAS 16/11) dated 1 May 2008.

### Background

A water supply protection zone (WPZ) is presently defined in the Mackenzie District Plan to provide some protection for the Twizel water supply, which is sourced from three wells adjacent to the Fraser River. Opus were approached by Council to comment on the existing WPZ, and noted that the existing WPZ did not appear to be located in an area that would provide protection to the water supply given the local geology and groundwater flow direction (Letter Birdling/O'Connor, 24 August 2007, ref. 3CW494.00).

Opus' recommendation was that the WPZ should be redefined in accordance with the default provisions set out in the proposed regional water plan (the NRRP) to provide consistency between the District Plan and the NRRP. This was to be included with other changes proposed to the District Plan.

### Mr Shearer's Submission

A submission on the proposed WPZ was received from Mr Alistair Shearer. This submission maintains that the WPZ for the Twizel water supply should be much smaller, based on a site specific assessment contained in the submission. The submission asserts that there is "*no risk of contamination of the 15 metre deep water supply wells from septic tank outlets above the shallow groundwater in the proposed protection zone.*" This assertion is supported by a statement that no *E.Coli* has been detected in the well water tests during routine monitoring.

The submission requests that the proposed WPZ be removed, and that a site-specific assessment be carried out to determine a revised size of the WPZ.

### Opus Response

We concur with the points raised in your Memorandum of 1 May. We also offer some further comment as below.

The importance of drinking-water sources is recognised in various Acts, Regulations and Plans. A common theme is that drinking



water needs to be considered from 'catchment to the tap'. This forms the basis of most water supply authorities' current approach to maintaining and enhancing the quality of their drinking water. We believe that Mr Shearer's assessment of risk contained within his submission does not align with the approach typically required by the Ministry of Health (MOH). Ultimately, Council are required to prepare a Public Health Risk Management Plan (PHRMP) to comply with the recently amended Health Act. This will include (amongst other things) an assessment of the catchment's risks, and the PHRMP is required to be approved by the local Drinking Water Assessor (i.e. MOH).

A site-specific assessment as explained in the NRRP should consider a number of factors. These factors, and some comment on how the Twizel situation would likely be assessed by the MOH is listed below:

- Depth of well: Shallow wells are generally considered to have higher risks from contamination. The Twizel wells draw water from an unconfined aquifer approximately 10-15m deep and are considered to be shallow.
- Pumping rates: Higher pumping rates can be considered to have higher risk of contamination as the velocity that water travels toward the well is higher, and any contamination will arrive sooner, giving it less time to disperse and degrade. The Twizel wells have relatively high pumping rates.
- Type of Contaminant: Some contaminants (e.g. bacteria) will degrade naturally as the water moves through the aquifer. The high permeability of the local alluvium reduces the time taken and consequently the 'die off' of these types of contaminant. Other contaminants (e.g. chemical) will degrade slowly, or not at all. The area surrounding the Twizel wells could potentially receive contaminants that that may not degrade quickly or at all (e.g. agrichemicals).
- Potential Risk to Water Quality: Twizel currently has few barriers to contamination – basically only the limited filtration provided by the gravels. This means that the risk to the water supply from contamination at the source is relatively high as this contamination would not be treated post-extraction.

Taking the above into account, it seems that the Twizel wells have a relatively high risk of contamination, and this justifies a conservative approach to determining the size of the Water Supply Protection Zone (as is provided by the default areas suggested in the NRRP and in the proposed plan change). We believe that this approach will be supported by the Ministry of Health, and that Mr Shearer's assessment of risk would simply not be accepted.

Further, the implication that only septic tank discharges present a risk is not correct – potential risks may arise from a variety of agricultural and/or industrial discharges, as well as from seemingly innocent activities such as earthworks in the WPZ area. The drawdown created by the wells enables contaminants entering the groundwater from the surface to move laterally toward the well. We note that there have apparently been occasional instances of *E.Coli* detected in the well water which is typical of shallow wells in unconfined aquifers, and an indication that the wells are susceptible to surface influences and contamination.

A more specific and detailed assessment including site works and specialist hydrogeological investigation might allow parts of the proposed WPZ to be removed; however it seems unlikely that a significant reduction in the area would result and there would be significant costs and time associated with such investigations which we do not believe are justified.

Another point of note is that the general public's perception of any risk from activities in the area can also be a significant issue. As an example, we are aware of another South Island town who have a disused landfill upgradient of their water supply wells. Although there is no 'technical' evidence of contamination, the issue of the 'old landfill' remains a very strong driver to abandon the existing supply and relocate the supply. We believe that a similar response is likely if there is a public perception of uncontrolled activity in the vicinity of Twizel's existing wells.

### Summary

- We acknowledge Mr Shearer's comments relating to site-specific risk assessments, but believe that the proposed WPZ is appropriate for the Twizel situation and that little benefit would result from additional site investigations.
- We disagree with Mr Shearer's assessment of risk, and note that it is unlikely to be supported by the Ministry of Health.
- We concur with your comments in your Memorandum of 1 May 2008, and agree that it is desirable to implement a WPZ prior to significant development occurring in the proposed area.

Please contact me if you have any questions relating to this letter.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Greg Birdling', with a long horizontal flourish extending to the right.

Greg Birdling  
Principal Environmental Engineer