

SUMMARY STATEMENT OF LAURA DRUMMOND FOR WAIMAKARIRI IRRIGATION LIMITED

1. My full name is Laura Rose Drummond. I am a Senior Ecologist at Pattle Delamore Partners Ltd and provided a statement of evidence for Waimakariri Irrigation Limited dated 17 July 2020. My qualifications and experience are provided in my evidence in chief. In this statement I summarise key points of my evidence that relate to proposed reductions in nitrate losses to reduce nitrogen levels in spring-fed streams within the Kaiapoi catchment.

CURRENT WATER QUALITY

2. Current surface water quality data reported in Greer & Meredith (2017) is limited; however, it is clear an improvement in nitrate levels is required in some spring-fed streams to meet objectives set in Table 8-5 of PC7.
3. The primary drivers in reduced water quality and in-stream ecology of the spring-fed streams in the Kaiapoi catchment are elevated nutrients (nitrogen and phosphorus), sediment input resulting in high levels of deposited fine sediments, faecal contamination (*E. coli*), low flow levels, lack of riparian vegetation and fish passage barriers.
4. The main concern with the high nitrogen concentrations is nitrate toxicity, as high levels can impact growth of fish species, as well as having lethal effects for sensitive species at higher concentrations.
5. In my view, the available surface water monitoring data does not show a consistent upward trend in nitrate concentrations across the spring-fed streams in the Kaiapoi catchment. Rather, isolated 'hotspots' such as Silverstream are evident and should be the focus of surface water mitigation measures.
6. I note an error in paragraph 32 on page 6 of my evidence, which states that Silverstream has the oldest water of the lowland spring-fed streams. In fact, this should be youngest. This does not change my opinion that Silverstream requires targeted and innovative methods to reduce nitrate levels.

ENVIRONMENT CANTERBURY'S PREDICTION OF FUTURE NITRATE CONCENTRATIONS IN SPRING-FED STREAMS WITHIN THE KAIAPOI CATCHMENT

7. Groundwater modelling completed by Environment Canterbury has predicted an increase in nitrate levels in most spring-fed streams within the Kaiapoi catchment due to a 'load to come' from historical activities; however, groundwater and surface water quality monitoring to support this is limited, as discussed in the evidence of Neil Thomas, and I consider this an uncertain extrapolation.
8. Based on the relatively young age of water in the spring-fed streams, the current water quality shows the impacts of recent land use (4-10 years). Over the past 10 years there has been a much greater awareness amongst farmers of the need to better manage and minimise nutrient losses to receiving environments.

WIL APPROACH

9. WIL is proposing to further develop land and water management initiatives that in my opinion provide a more constructive approach to improve stream water quality than the longer-term regime of nitrogen loss reductions currently proposed in PC7. These initiatives include achievable reductions in nitrogen leaching from land-use activities (as discussed in the evidence of Mr Jeremy Sanson), Managed Aquifer Recharge (MAR) and Targeted Stream Augmentation (TSA), spring-fed stream habitat restoration, and an improved monitoring programme.
10. MAR was not accounted for in Environment Canterbury modelling but was supported in the Waimakariri ZIPA. An expert science panel determined that for the Cust Main Drain, Ohoka River and Silverstream, dilution by flow augmentation can potentially reduce the median NO₃-N concentration by 20-25%, 50% and 50%, respectively (Arthur et al., 2019).
11. WIL are implementing restoration works on several waterways within the Scheme. The aim of these restoration works is to improve the instream habitat quality of the streams, increase aquatic and terrestrial biodiversity and reduce overland runoff of contaminants to these spring-fed headwater tributaries. This will in turn add to a reduction in contaminants in downstream lowland streams. In addition, WIL have recently begun an initiative to survey the ecological value of the water-race network within the scheme and identify and map high value habitat areas.

12. In my statement of evidence, I noted that WIL was proposing to implement a monitoring programme to provide better site coverage at a more suitable monthly timeframe. By way of update following my evidence being provided, I can now confirm that this programme is underway. The monitoring programme will complement the existing Environment Canterbury programme to provide a better characterisation of water quality issues and trends (along with the effects of current land use activities).

CONCLUDING COMMENT

13. I am in agreement that reductions in nitrate need to occur in some spring-fed streams within the Kaiapoi catchment to improve toxicity effects and ecosystem health, this also needs to be partnered with improvements to other contaminants (phosphorus, sediment and *E. coli*), as well as physical improvements (instream habitat, riparian planting etc.).
14. Rather than relying on reductions to farming nitrogen losses alone, the WIL approach seeks that these reductions are supported by other initiatives (MAR/TSA, habitat restoration) which are aimed for a cumulative reduction in contaminants that feed the spring-fed streams of the Kaiapoi catchment.
15. Proposed reductions and initiatives need to be achievable and be supported by suitable monitoring (monthly) over time to determine compliance with water quality limits and targets in PC7.

Laura Drummond

11 November 2020