

## **Mid-Canterbury Water Monitoring Programme taking next steps to support land management**

After six years of a comprehensive water monitoring programme farmers in Mid-Canterbury, as part of MHV Water, are supporting the use of the data to conduct research into the soil and geological-specific correlations between nitrate concentrations in groundwater and farm systems; with the aim to enable farmers to make on-farm evidence-based decisions to drive improved water quality outcomes.

MHV Water is a farmer-owned irrigation scheme that manages and delivers water for irrigation to approximately 58 000 hectares of farmland in Mid-Canterbury between the Ashburton and Rangitata rivers. As a co-operative, the farmers collectively own the infrastructure, and MHV Water staff are tasked with managing the infrastructure which delivers water across the district. Additionally, MHV manages the environmental education and compliance for its shareholders - and the water quality monitoring programme is an integral part of their business.

MHV commenced routine groundwater monitoring of Nitrate-Nitrogen (NO<sub>3</sub>-N) within the MHV scheme area in September 2016 – with an initial 25 bores; the early objective of the programme was to understand the changes in NO<sub>3</sub>-N in the groundwater of the Hekeao Hinds Plains.

As the focus of the monitoring programme has evolved over time, so has the design of the programme. With collaboration and support from the Hekeao Hinds Water Enhancement Trust (HHWET), and Barrhill Chertsey Irrigation Ltd, the programme has extended beyond MHV's operational blueprint and now includes some 150 bores and 60 surface water sites.

MHV Water Senior Hydrogeologist Justin Legg largely leads the programme and has recently said it was important to consider “what now” when it came to the results. To answer this question, he will commence a PhD at the University of Otago this spring that hopes to quantify and define the key drivers of Nitrate-Nitrogen (NO<sub>3</sub>-N) sources, migration, and retention across the Hekeao Hinds Plains for different farm systems with the intention of defining solutions for the co-existence of improving water quality practices and farming communities.

Justin said that the results from the programme had helped MHV to gain a better understanding of the variable distribution of NO<sub>3</sub>-N concentrations across the catchment based on the interaction of rainfall, hydrology, and soil types. Through investigating these relationships, it is hoped that we can develop a farm system management framework to support farmers to focus on the most effective changes at farm scale that will support further improvements to water quality outcomes across the catchment.



***Justin Legg water testing in the Hekeao Hinds catchment.***

“The aim of the programme is to help farmers reduce nitrate leeching at a farm scale and with varying systems and land types, with land, water, and people front of mind. Based on the monitoring programme, there is a strong foundation of existing data and information. This along with institutional knowledge will allow the research to be

holistic and integrated rather than focussing on one aspect alone. Consequently, the value proposition is higher than getting a third party to undertake the work.”

With the support of MHV Justin will carry out the research part-time over the next six years through the University of Otago. Rather than a single lengthy thesis, the research will produce three peer-reviewed publications.

“This means that results and findings can be delivered throughout the research programme rather than at its conclusion.”

“The hydrology both on the surface and beneath our feet is hugely complex and so is the part that nitrogen plays in that, I am excited to find out more about it and support fact and science-based decision making to help remove the element of doubt around if what is being done will actually make a difference.”