[redacted] 1581

From: [redacted]
Sent: Wednesday, 14 March 2018 10:31 p.m.
To: Waikoropupu
Subject: WCO Application - Submission

Dear Tribunal Members,

I was unaware that the closing time for submissions was 4pm on 14 March, but still wish to make a submission today being still Wed 14 March.

My submission relates to all of the application, and I support the application.

I first saw Te Waikoropupu Springs as a young science student in the summer of 1965/66, when the springs were not provided with the status they enjoy today and farming practices were significantly less intensive. The serenity and peacefulness of the rural setting and sheer size of the springs was arresting, giving an almost surreal, other-worldly atmosphere to the surroundings, that is still present today. However, my lasting memory remains not only of the astonishing and outstanding clarity of the water, the clearest freshwater measured, but also the sheer volume of water emanating from the main spring vent which created a dome of such force that it reached close to a metre above the surrounding water level. This observation has also been noted by others with longstanding contact with the springs, and the fact that it is not so dramatically marked or apparent today suggests a change in the aquifer feeding the springs.

I am now privileged to live in Golden Bay and have closer involvement with this remarkable and internationally significant water body. It is through an elsewhere unknown combination of factors, geographical, geological, and biological that collectively contribute to this astonishing natural feature that now attracts around 100,000 visitors annually. While our understanding of these contributing features has progressed somewhat, our knowledge is still very inadequate and incomplete. What we have learnt though is that the stygofauna, the collective assemblage of organisms from bacteria to crustaceans that live in the labyrinth of underground caverns and chambers in the surrounding karst landscape that make up the huge reservoir that feeds the main aquifer, are responsible for cleaning the water of its dissolved and suspended organic matter. More than 100 species have so far been identified but we have barely scratched the surface in our knowledge of these and undoubtedly there are many more species yet to be discovered. We know very little about the life cycles of these organisms, nor of the conditions required for their optimum health.
By the very nature of their subterranean existence and inaccessibility, gaining a fuller picture of their lifestyles and requirements is not easy and will take years. Scientific research has only recently focussed on this micro and macrofauna, but already some clear indications of requirements for their healthy existence have emerged. The general scientific consensus is that the stygofauna require an adequate supply of dissolved oxygen, and freedom from toxicants such as heavy metals and the more ubiquitous dissolved nitrates and phosphates.

Over the last 30+ years farming practices have changed significantly. There is now widespread use of nitrogen-rich fertilisers, increased reliance on irrigation, and increased intensification of land use with an accompanying increased use of a wide spectrum of synthetic chemicals. This has been especially marked in the dramatic increase in large-scale dairying, with the resulting increased release of nitrogen-rich urine onto the land. The significance of this in the Takaka valley is that this area is the 'recharge zone' of the aquifer that feeds the springs. Any chemicals applied to the land in this valley will inevitably find their way into the underground aquifers. We have little understanding of the levels of many of these chemicals that can be tolerated by the stygofauna. However for nitrate-nitrogen, there is a commonly held belief among NIWA freshwater scientists who have studied this system the most, that 4 mg per litre of water is the upper limit that can be tolerated by the all important stygofauna.

Water sampling carried out and privately funded by a concerned group of Golden Bay residents, with careful independent analysis by GNS Science and Cawthron Institute over the last two years has shown a steadily increasing nitrate-nitrogen level that is already at and often above the 4 mg/l level. When it is remembered that water in the deep aquifer spends around 10 years undergound before surfacing at the springs, what we are measuring now is the result of activities 10 years ago. The present analytical results therefore give concern for the present impact that will not become apparent for around 10 years in the future.

In such situations where the underlying science is poorly and incompletely understood and we are reliant on grossly incomplete data to inform decision making, the prudent strategy is to take a precautionary approach to the crucial decisions on land use and water management that actually or potentially impact on this resource.

I have great concern that the economic interests of powerful and determined sectors of our community are put ahead of concerns for environmental sustainability. Our history as a young nation is unfortunately strewn with too many examples of decisions made in the name of economic progress that in hindsight have been demonstrably unsound and directly led to environmental disasters and degradation. We have an unenviable reputation for species extinction - we run a considerable risk that if we do not provide adequate protection for these truly remarkable organisms of the stygofauna, many still to be discovered and almost all not understood at all in their life history, - that they too will be driven to extinction. Sadly, politicans and decision makers of all hues are

very prone to ignoring sound specialist advice, especially when it urges great caution, and bending to the will of the loudest clamouring voices.

What is urgently required is the highest level of protection for this outstanding body of water and its associated underground aquifers to allow time for more in depth research to guide us in its best management and the complementary land use practices that ensure its future health. The Water Conservation Order before the tribunal is the best protection that can be granted under present legislation. We must behave with humility and in recognition that we do not have all the answers, and must therefore act conservatively to preserve such treasures for future generations. It would be unconcionably selfish to allow practices now in the present interests of only a section of the community that jeopardised the health of the springs for all to enjoy and marvel at into the future. The warning signs of environmental tipping point are sufficiently clear right now to give cause for immediate concern. We need urgent safeguarding action, not simply words.

I implore the tribunal members to act decisively and grant this Water Conservation Order with adequate conditions attached to fully protect this body of water - the springs and its feeder aquifers. Worrying changes in the parameters of this water body are already observable. There is a high risk that some of these changes may be irreversible. There is absolutely no doubt that species extinction is forever. We cannot entertain even the possibility that this will occur by our inaction.

Please grant approval for this Water Conservation Order in all its component elements.

Gordon Mather
B.Sc., M.Aud.

I wish to be heard in person before the Tribunal when it considers submissions.