STATEMENT OF JOHN MURRAY NEILSON to The Commissioner's Panel Hearing for the Proposed Plan Change 5A (Lindis: Integrated water management) to the Regional Plan: Water for Otago.

The main points of my submission which I would like the Hearing Panel to consider are:

- I retired, as Technical Support Officer: Freshwater Ecosystems for the Department of Conservation's (DOC's) Otago Conservancy, serving 25 years in that and similar roles. Prior to that I had spent 12 years in Dunedin with the N.Z. Wildlife Service, working throughout Otago, Southland and South Canterbury, on wetland and other freshwater issues. As part of my duties I presented evidence to ORC hearings panels and to the Environment Court on several occasions.

- I am a Clutha Fisheries Trustee and a coopted member of the Otago Fish and Game Council. I support and endorse the submissions of both these organizations and their evidence given before this Hearing. However this is my own independent submission.

- I oppose the proposed summer minimum flow of 750 l/s, at the Ardgour flow recorder, from 1 October to 31 May, and wish to see this amended to 1000 l/s at the same point, applying from 1 October to 30 April.

- While employed by DOC I was involved with the Lindis River issues and was the "architect "of the department's decision to support Tarras Water Ltd's resource consent application to take water from the Clutha River, in substitution for many of the takes from the Lindis River. This decision was premised on the potential environmental flow benefits to the Lindis River that would have eventuated had this proposal gone ahead. In particular, the re-establishment of a continuous year-round surface flow connection with the Clutha River. This would have had ecosystem as well as species benefits for native fish, such as longfin eels, many more of which will be migrating up the Clutha River, in future, once Contact Energy Ltd has satisfied its Clutha Hydro consent conditions for the re-establishment of both upstream and downstream passage for these chronically threatened fish. The evidence of Mr. Viall and that of Mr. Dale both contain more information on this issue, which should have been covered in more depth in the evidence of the Minister of Conservation's witnesses, Mr.Deavoll and Mr. Jack, but, disappointingly, is only given a cursory mention in both briefs.

- During my time with DOC I was involved with national, as well as regional, freshwater and native fish initiatives, policies and strategies, so I am well aware of the intricacies involved with these issues. One of these was my involvement on a small departmental advisory group that peer reviewed the expert scientist's contribution to the "Proposed National Environmental

Standard on Ecological Flows and Water Levels – A discussion document (MFE 2008)" (Proposed NES on Ecological Flows and Water levels). This advisory group also assisted with DOC's contribution to the development of the companion document: "Draft Guidelines for the selection of Methods to Determine Ecological Flows and Water levels. (Report prepared by Beca Infrastructure Ltd for MFE. Wellington: Ministry for the Environment.)."

- My reading of the National Policy Statement for Freshwater Management 2014 (NPSFM) leads me to believe that the Otago Regional Council (ORC) must set an environmental flow for the Lindis River under the Regional Plan: Water (RPW) which gives effect to the objectives of the NPSFM. In particular, "Objective B1: To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water"; "Objective B2: To avoid any further over-allocation of fresh water and phase out existing over allocation"; and "Objective B3: To improve and maximize the efficient allocation and efficient use of water".

- In doing so, the ORC must provide for the compulsory values and may provide for other national values or other values, while considering the impacts on local communities and people (emphasis added). Other national values and other values (e.g. those values identified by the community at the Lindis minimum flow consultation meetings convened by ORC) may be provided for but they cannot be substituted for the compulsory values, which must be provided for (emphasis added).

- ORC contends that its RPW does give effect to the objectives of the NPSFM, in particular:

  i) *"Objective 5.3.1: To maintain or enhance the natural and human use values identified in Schedules 1A, 1B and 1C that are supported by Otago's lakes and rivers."*

  ii) *"Objective 5.3.3 To protect the natural character of Otago's lakes and rivers and their margins from inappropriate subdivision use or development'*

  iii) *"Objective 6.3.1: To retain flows in rivers sufficient to maintain their life-supporting capacity for aquatic ecosystems, and their natural character."*

- The natural fishery values as listed in the RPW Schedules and as mentioned in the OFGC Submission and which require to be maintained or enhanced are trout, juvenile trout and eels. However, as recent work by OFGC attests, upland bullies also need to be added to this list as significant numbers of these fish are now known to be present in the Lindis River. Other native

fauna which, in particular, need to be considered, as mentioned in the CFT submission, are black-fronted terns, black-billed gulls and pied stilts. The gulls have a *"nationally critical"* conservation status, the terns are *"nationally endangered"* and the stilts are *"declining"* Mr. Van Klink's evidence supports CFT's submission.

- Under *"Objective 5.3.3"* the natural character of Otago's lakes and rivers is defined in the following way: *"The natural character of Otago's lakes and rivers and their margins is made up of a range of physical, ecological and cultural qualities. These relate to the lake's or river's topography, including the setting and bed form, natural flow and level characteristics, ecology and the extent of development within the catchment. The degree of natural character and what is considered to be inappropriate subdivision, use and development, will vary from place to place."*

- The morphology of the lower Lindis is that of a braided river, currently with greatly reduced flow due to water abstraction for irrigation. A flow which would restore its braided natural character is required.

- In order to maintain the life-supporting capacity of the aquatic ecosystem of the lower Lindis (Objective 6.3.1), as well as its natural character, a continuous flow is required for trout, eels, and bullies and also for the pied stilts which breed on the river bed and require the protection from predators, provided by river braids. Such a continuous braided flow would also provide potential breeding habitat for the black-billed gulls and black-fronted terns which frequent the area, while also providing more secure feeding and loafing habitat for these threatened endemic birds.

- ORC's Section 32 Report acknowledges that the Lindis River is over-allocated. The report also acknowledges that under natural conditions the Lindis would flow to the Clutha River year-round and that the MALF is now estimated to be 1864 l/s, rather than the earlier estimation of 1610 l/s.

- While the Proposed NES on Ecological Flows and Water Levels has not yet been adopted and is on hold and it deals with interim levels, it did represent the combined expert opinion of what

was required to "hold the line" in terms of minimum flows and levels in water bodies. Therefore its recommendations should not be dismissed.

The recommended minimum flow derived from this process was, for rivers with a mean flow of 5 cumecs or more (such as the Lindis) was "A *minimum flow of 80% of MALF as calculated by the regional council.....*".

- Mr. Hickey contends, in his evidence, that no credence should be given to the Proposed NES, as the interim limits were only to be applied to rivers which had low values and were subject to little pressure, and that it is the methods included in the BECA report which are the relevant methods to use in the Lindis, in particular, IFIM, which, in his opinion, is the best available science to use. The use of IFIM has been criticized both here in N.Z. (e.g.Hudson et al, 2003) and overseas (e.g. Instream Flow Workshop, US Fish and Wildlife Service, 2010). For instance, it concentrates only on the presence of suitable physical habitat, but ignores other parameters which influence the suitability of habitat for fish, such as the presence of a suitable food supply. There is also the logic of this approach to be considered – why establish a precautionary minimum flow, as a higher proportion of MALF, for a river with low values and little pressure, than would eventuate from the establishment of a minimum flow using IFIM for a river with higher ecological values and higher pressures?

- The small departmental advisory group I have previously mentioned, was active in recommending more holistic methods of flow-setting, leading up to the publication of the Proposed NES, in 2008. In 2010 DOC sent me, along with Taupo Fishery Scientist, Michel Dedual, to an Instream Flows Workshop in Virginia, USA, run by the US Federal Fish and Wildlife Service. There, we were exposed to some of the international criticism of IFIM, and to the ongoing development of other more holistic methods of instream flow setting.

- New Zealand scientists are active in this regard and one of the more promising methods is that being developed by the Cawthron Institute and which is discussed in Mr Gabrielson's evidence: NREI (Net Rate of Energy Intake). This method was recently trialed in the Mataura River by Dr. John Hayes of the Cawthron Institute (Hayes et al in press), along with the use of IFIM and produced results which showed that, in that river, brown trout required a higher minimum flow

in order to satisfy their life cycle requirements than would have been provided by a flow based on the use of IFIM. I believe that this method is now the best available scientific method to use for flow setting in NZ, and I understand that ORC is planning to trial this method, in the Clutha River, alongside IFIM, either this season or next season.

- Mr. Gabrielson's and Mr. Trotter's evidence discuss the inadequacies of the proposed 750 l/s minimum flow and Mr. Horrell's aerial photos show graphic evidence of these. Mr. Horrell's photos also show that a minimum flow of around 1000 l/s, at the Ardgour Flow Recorder, while manifestly less than the recommended 80% of MALF (in recognition of the use of water by the Lindis catchment community), adequately provides for the braided ecosystem functions of the lower section of the Lindis River at times of summer low flow.

Thank you for your time

Murray Neilson

31 March 2016

## References

Hayes JW, Goodwin E, Shearer KA, Hay J, Kelly L In press. Can WUA Correctly Predict the Flow Requirements of Drift-Feeding Trout? —Comparison of a Hydraulic-habitat Model and a Drift-Net Rate of Energy Intake Model. Transactions of the American Fisheries Society.

Hudson H, Byrom A and Chadderton W 2003. A critique of IFIM—instream habitat simulation in the New Zealand context. Science for Conservation 231. 69 p.