BEFORE THE ENVIRONMENT COURT **ENV-2018-CHC-37**

I MUA I TE KOOTI TAIAO O AOTEAROA **ENV-2018-CHC-50**

IN THE MATTER	of the Resource Management Act 1991
AND	of appeals under Clause 14 of the First Schedule of the Act
BETWEEN	**SOUTHLAND FISH AND GAME COUNCIL** **Appellant**
AND	**ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INCORPORATED** **Appellant**
AND	**SOUTHLAND REGIONAL COUNCIL** **Respondent**

Memorandum of Counsel regarding Facilitated Meeting

Dated: 27 August 2019

COUNSEL for ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INC

SALLY GEPP
12 Harley Street
Nelson
7040
Phone: 021 558 241
Email: sally@sallygepp.co.nz

MAY IT PLEASE THE COURT

1) This memorandum responds to the Court's direction that the parties file and serve memoranda identifying data, facts and information relevant to the development of indicators of the ecological health. This Memorandum is filed on behalf of Southland Fish & Game Council and the Royal Forest and Bird Protection Society of New Zealand Inc.

2) Counsel apologises to the Court and parties for the late filing of this memorandum.

3) Science advisors for Fish & Game (Dr Canning) and Forest & Bird (Ms McArthur) have reviewed the lists of data, facts and information filed for Southland Regional Council, Ngā Rūnanga, the territorial authorities and Meridian Energy Ltd. It is considered that the following information, additional to those lists, are relevant:

    a) Freshwater fish database records for Southland

    b) Fish IBI scores for Southland sites

    c) Dissolved oxygen and temperature – any continuous monitoring data held by Southland Regional Council.

    d) Camargo, J. A. & Alonso, Á. Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment. Environ. Int. 32, 831–849 (2006).

    e) Clapcott J.E., Collier K.J., Death R.G., Goodwin E.O., Harding J.S., Kelly D., Leathwick J.R. & Young R.G. (2012) Quantifying relationships between land-use gradients and structural and functional indicators of stream ecological integrity. Freshwater Biology, 57, 74-90.

    f) Clapcott JE, Young RG, Harding JS, Matthaei CD, Quinn JM, Death RG 2011. Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values. Cawthron Institute, Nelson, New Zealand.

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h) Collier, K. J. Average score per metric: An alternative metric aggregation method for assessing wadeable stream health. New Zeal. J. Mar. Freshw. Res. 42, 367–378 (2008).

i) Death RG, Magierowski R, Tonkin JD, Canning AD 2018. Clean but not green. A Weight-of-Evidence Approach for Setting Nutrient Criteria in New Zealand Rivers. In Press. (including any updated dataset based on Professor Death's paper and methods).

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k) Dunn NR, Allibone RM, Closs GP, Crow SK, David BO, Goodman JM, Griffiths M, Jack DC, Ling N, Waters JM, Rolfe JR 2018. Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Department of Conservation, Wellington. 11 p.

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o) Guy Woodward, Mark O. Gessner, Paul S. Giller, Vladislav Gulis, Sally Hladyz, et al.. ContinentalScale Effects of Nutrient Pollution on Stream Ecosystem Functioning. Science Magazine, 2012, vol. 336, pp. 1438-1440. ff10.1126/science.1219534ff. ffhal-00958434ff

p) Joy, M. K. & Death, R. G. Application of the Index of Biotic Integrity Methodology to New Zealand Freshwater Fish Communities. Environ. Manage. 34, 415–428 (2004).

q) Joy, M. K., Foote, K. J., McNie, P. & Piria, M. Decline in New Zealand's freshwater fish fauna: effect of land use. Mar. Freshw. Res. 70, 114–124 (2019).

r) Leathwick JR, West DW, Moilanen A, Chadderton WL 2012. Development of a Systematic, Information-Based Approach to the Identification of High Value Sites for River Conservation in New Zealand. River Conservation and Management, John Wiley & Sons, Ltd: 183-191.

s) Matheson F, Quinn J, Hickey C 2012. Review of the New Zealand instream plant and nutrient guidelines and development of an extended decision-making framework: Phases 1 and 2 final report. Prepared for the Ministry of Science & Innovation Envirolink Fund. NIWA Client Report No: HAM2012-081. Canning AD. 2018. Predicting New Zealand riverine fish reference assemblages. PeerJ 6:e4890 https://doi.org/10.7717/peerj.4890

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aa) Robertson, B. M. et al. NZ Estuary Trophic Index Screening Tool 1. Determining eutrophication susceptibility using physical and nutrient load data. Prepared for Envirolink Tools Project: Estuarine Trophic Index, MBIE/NIWA Contract No: C01X1420. . (2015).

bb) Robertson, B. M. et al. NZ Estuary Trophic Index Screening Tool 2. Determining monitoring indicators and assessing estuary trophic state. Prepared for Envirolink Tools Project: Estuarine Trophic Index, MBIE/NIWA Contract No: C01X1420. . (Wriggle Ltd and NIWA, 2016).

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ee) Snelder T.H., McDowell R.W. & Fraser C.E. Estimation of Catchment Nutrient Loads in New Zealand Using Monthly Water Quality Monitoring Data. JAWRA J. Am. Water Resour. Assoc. 53, 158–178 (2017).

ff) Snelder, T. 2018 Nutrient concentration targets to achieve periphyton biomass objectives incorporating uncertainties. Lower Hutt, N.Z.: GNS Science. GNS Science report 2018/38. 41 p.; doi: 10.21420/AJSH-NW16

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hh) Veronica Ferreira, Bastien Castagneyrol, Julia Koricheva, Vladislav Gulis, Eric Chauvet, et al.. A meta-analysis of the effects of nutrient enrichment on litter decomposition in streams. Biological Reviews, Wiley, 2015, vol. 90 (n° 3), pp. 669-688. ff10.1111/brv.12125ff. ffhal-01186536ff

ii) West DW, Leathwick JR, Dean-Speirs TL 2018. Approaches to the Selection of a Network of Freshwater Ecosystems within NZ for Conservation. Aquatic Conservation: Marine and Freshwater Ecosystems, in press.

jj) Young, R. G., Matthaei, C. D. & Townsend, C. R. Organic matter breakdown and ecosystem metabolism: functional indicators for assessing river ecosystem health. J. North Am. Benthol. Soc. 27, 605–625 (2008).

4) Ms Ongley is unable to sign this Memorandum, but has indicated her agreement to it.

S Gepp
Counsel for Forest & Bird