

**BEFORE THE ENVIRONMENT COURT
I MUA I TE KOOTI TAIAO O AOTEAROA**

UNDER the Resource Management Act 1991

IN THE MATTER of appeals under Clause 14 of the First Schedule of the Act

BETWEEN

TRANSPOWER NEW ZEALAND LIMITED
(ENV-2018-CHC-26)

FONTERRA CO-OPERATIVE GROUP
(ENV-2018-CHC-27)

HORTICULTURE NEW ZEALAND
(ENV-2018-CHC-28)

ARATIATIA LIVESTOCK LIMITED
(ENV-2018-CHC-29)

WILKINS FARMING CO
(ENV-2018-CHC-30)

**MEMORANDUM OF COUNSEL FOR SOUTHLAND REGIONAL COUNCIL
REGARDING THE WATER QUALITY AND ECOLOGY (RIVERS AND
WETLANDS) EXPERT CONFERENCE - AGENDA
1 May 2019**

Judicial Officer: Judge Borthwick

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WYNNWILLIAMS

**GORE DISTRICT COUNCIL, SOUTHLAND DISTRICT
COUNCIL & INVERCARGILL DISTRICT COUNCIL**
(ENV-2018-CHC-31)

DAIRYNZ LIMITED
(ENV-2018-CHC-32)

H W RICHARDSON GROUP
(ENV-2018-CHC-33)

BEEF + LAMB NEW ZEALAND
(ENV-2018-CHC-34 & 35)

DIRECTOR-GENERAL OF CONSERVATION
(ENV-2018-CHC-36)

SOUTHLAND FISH AND GAME COUNCIL
(ENV-2018-CHC-37)

MERIDIAN ENERGY LIMITED Act 1991
(ENV-2018-CHC-38)

ALLIANCE GROUP LIMITED
(ENV-2018-CHC-39)

FEDERATED FARMERS OF NEW ZEALAND
(ENV-2018-CHC-40)

HERITAGE NEW ZEALAND POUHERE TAONGA
(ENV-2018-CHC-41)

STONEY CREEK STATION LIMITED
(ENV-2018-CHC-42)

THE TERRACES LIMITED
(ENV-2018-CHC-43)

CAMPBELL'S BLOCK LIMITED
(ENV-2018-CHC-44)

ROBERT GRANT
(ENV-2018-CHC-45)

**SOUTHWOOD EXPORT LIMITED, KODANSHA
TREEFARM NEW ZEALAND LIMITED, SOUTHLAND
PLANTATION FOREST COMPANY OF NEW ZEALAND**
(ENV-2018-CHC-46)

**TE RUNANGA O NGAI TAHU, HOKONUI RUNAKA,
WAIHOPAI RUNAKA, TE RUNANGA O AWARUA & TE
RUNANGA O ORAKA APARIMA**
(ENV-2018-CHC-47)

PETER CHARTRES
(ENV-2018-CHC-48)

RAYONIER NEW ZEALAND LIMITED
(ENV-2018-CHC-49)

**ROYAL FOREST AND BIRD PROTECTION SOCIETY
OF NEW ZEALAND**
(ENV-2018-CHC-50)

Appellants

AND

SOUTHLAND REGIONAL COUNCIL

Respondent

MAY IT PLEASE THE COURT

- 1 This Memorandum of Counsel is filed on behalf of the Southland Regional Council (**Council**) in respect of the appeals against the Council's decision on the proposed Southland Water and Land Plan (**pSWLP**).
- 2 This Memorandum provides the final agenda for the expert conference on water quality and ecology (rivers and wetlands), as directed by the Court in its Minute dated 15 April 2019 and the Amended Notice of Expert Conferencing dated 18 April 2019.
- 3 It also responds to Commissioner Hodges' comments on the draft agenda received by email (via Karina Kelly) on 30 April 2019.

Final agenda

- 4 In its Minute dated 15 April 2019, the Court directed that a final agenda for each expert conference is to be prepared in accordance with the Court's Minute dated 2 April 2019¹, and filed with the Commissioner through the registry for review five full working days before the start of the conference.²
- 5 Counsel for the Council prepared a draft agenda, with input from the Council's relevant technical and planning experts, and circulated this to the parties for their input. Counsel for the Council endeavoured to collate all parties' comments into a revised draft agenda. This revised draft agenda was circulated to the relevant parties, along with the draft agenda prepared by Commissioner Hodges.
- 6 Following feedback from the parties, a draft agenda was filed with the Commissioner (through the registry) on 29 April 2019. Comments from the Commissioner were received by email (from Karina Kelly) on 30 April 2019.
- 7 Having conferred with the parties, Counsel for the Council has addressed the Commissioner's comments, in consultation with the

¹ Which directed that the agenda is to be prepared with substantive input by the relevant experts to ensure it captures the issues adequately. It also directed that the agendas are to be prepared with input from planning experts, who must identify the proposed plan provisions relevant to each conference, so that the technical experts focus their conference outputs on matters of greatest interest to the court. When preparing the agenda, the experts should consider the interests and concerns of the parties involved.

² Minute of the Environment Court dated 15 April 2019 at [10(b)].

relevant parties, and incorporated these into the final agenda, which is attached as **Appendix 1**. A copy of the agenda showing the changes between the draft agenda and the final agenda (in tracking) is attached as **Appendix 2**.

Responses to Commissioner's comments

8 As noted above, comments on the draft agenda from Commissioner Hodges were received by email on 30 April 2019.

9 Each of these comments is addressed in turn below.

1 - That copies of the court minute dated 15 April 2019 and attached draft agenda were provided to all water quality, ecology and planning experts prior to preparation of the proposed agenda as directed in paragraph [10](a) of the minute

10 Karina Kelly, the case manager for the pSWLP conferences, sent the Minute of the Court dated 15 April 2019 with Commissioner Hodge's draft agenda to all parties/Counsel. The Minute directed all parties to provide a copy to all water quality, ecology and planning experts prior to preparation of an agenda.

11 Prior to receiving this Minute (and the resulting change of date of the conference), the parties with experts participating in the conference had collaboratively prepared a draft agenda.

12 Counsel for the Southland Regional Council circulated the Minute of the Court dated 15 April 2019 (with the draft agenda prepared by Commissioner Hodges) to all parties/Counsel and sought their comment on whether parties had a preference as to which approach and/or questions were used in the agenda (i.e., the draft prepared by Commissioner Hodges, the draft that had already been prepared by the parties, or a combination of the two).³ Based on the responses received from the parties, the draft agenda previously prepared by the parties was retained, and modified to include some of the additional information and questions from the Commissioner's draft agenda.

³ Noting that Commissioner Hodges had not required that his suggested agenda be adopted.

13 Counsel for the Council confirms that the Minute was provided to the Council's relevant experts (Mr Ward, Dr Lloyd, and Mr McCallum-Clark), as directed by the Court. Counsel sought confirmation from the parties that they provided the Minute to their relevant experts as directed by the Court. The relevant parties advised that they provided the Minute to each of their technical science experts, however many parties did not explicitly confirm that it was provided to their planning experts.

2 - That the draft agenda was prepared with substantive input by the relevant experts to ensure it captures the issues adequately, as directed in paragraph [7] (v) of Judge Borthwick's minute dated 2 April 2019, and setting out details of all experts that participated in agenda preparation and what the substantive input comprised

14 As set out above, Counsel for the Council asked all parties for their views / comments on the draft agendas (being the one prepared by Commissioner Hodges and the one already prepared by the parties involved in the water quality and ecology (rivers & wetlands) conference).

15 A substantive number of comments and suggestions were received from the relevant experts (via Counsel), including from the Council, Royal Forest and Bird Protection Society of New Zealand, Southland Fish and Game Council, Ngā Rūnanga, Meridian Energy Limited, DairyNZ Limited, Fonterra Co-operative Group, Director-General of Conservation, the Territorial Authorities, and Ravensdown. These comments and suggestions were incorporated into the draft agenda.

3 - As paragraph 15 quite correctly notes that the plan provisions themselves are not a topic/issue for the conference, it would help if an explanatory paragraph could be added before paragraph 14 to explain the reason they are included and avoid any potential for confusion - for example, is it intended that the experts will express their opinions on their effectiveness in managing effects?

16 These plan provisions were included as directed by the Court in its Minute on conferencing dated 2 April 2019. The agenda has been amended to reflect this more clearly (see paragraph 13 of the agenda).

17 The agenda has also been amended to clarify that agenda item 25 (now 26) asks the experts to consider the effectiveness of the plan provisions in managing freshwater quality throughout the region (noting that while

the experts can express their views on the effectiveness of the plan provisions, this should only be in their capacity as freshwater science experts and noting the limited scope of the Topic A hearing).

4 - Can electronic copies of the relevant plan provisions listed in section 14 of the proposed agenda be made available to the experts (if they do not already have them) and to the court by 5 p.m. on Friday 3 May 2019?

18 The plan provisions referred to (with some minor exceptions) were sent to all parties, including the Court, by email on 12 April 2019.

19 As noted above, there are some minor exceptions. The following plan provisions have been identified by parties as potentially relevant since the filing of the above Memorandum:

(a) Te Mana o te Wai (page 5 of the Appeals version of the pSWLP).

(b) Objective 3 (noting this objective is not subject to appeal).

(c) Objective 15 (noting this objective is not subject to appeal).

20 Each of these provisions can be found by following the link to the Appeals version of the pSWLP provided in the Memorandum of Counsel on behalf of the Council dated 12 April 2019 (and as provided to the Court via USB).

5 - That paragraphs 2 and 3 be deleted as they repeat information already provided earlier in the JWS

21 The agenda has been amended accordingly.

6 - That participating expert information is provided as set out in his draft as this is now commonly used in many Environment Court joint witness statements and including the signatures avoids repetition at the end - it is also worth noting that experts are participating as independent experts assisting the court and while they will be employed or engaged by a party they are not participating "for" that party

22 The agenda has been amended accordingly (see paragraph 2 of the agenda).

7 - That an appropriate expert provides draft inputs to paragraphs 13 (information sources relied on) and 16 (definitions) for other to review and modify as appropriate at the conference, hence saving considerable time

23 Mr Hodson (Southland Regional Council) has drafted the draft inputs to the key information sources relied on (see paragraph 11) and the definitions (see paragraph 14) for the experts to discuss and modify, as appropriate, at the conference. These are set out in the final agenda in **Appendix 1**.

8 - That a map be provided and attached to the JWS and that experts consider what additional attachments to the JWS might assist the court

24 A map of the Southland Region, including major surface water bodies, (taken from page 29 of the evidence of Mr Hodson) has been attached to the final agenda.

9 - As the draft agenda does not address over-allocation, human health, mahinga kai, cultural indicators, threatened species, toxicity, inter-relationship with groundwater and surface water quantity, climate change and a range of other topics he found reference to in the evidence and/or which may be of interest to the court, how do the parties see these matters being addressed, if at all? This should be made clear. If these are matters the experts consider relevant, should they not be addressed at the conference?

25 The Commissioner has identified some additional topics that were not expressly covered by the draft agenda. While they have not been identified as issues in those terms by the parties or their experts, the extent of agreement/disagreement on these topics is unclear in advance of rebuttal evidence being exchanged and as such Counsel considers it is prudent to include them in the agenda. A new item 27 has been included in that regard.

DATED this 1st day of May 2019



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P A C Maw / K J Wyss
 Counsel for the Southland Regional Council

Appendix 1 – final agenda

EXPERT CONFERENCE —WATER QUALITY AND ECOLOGY (RIVERS & WETLANDS)

ENV-2018-CHC — 026, 29, 37, 38, 39, 40, 41, 47, 50

Various s274 parties

Topic: Proposed Southland Water and Land Plan - Southland Regional Council

Date: Tuesday, 7 May 2019 – Wednesday, 8 May 2019

Time: 09:00 AM

Venue: Conference Room, Kelvin Hotel, 20 Kelvin Street, Invercargill

Facilitator: Jim Hodges, Environment Commissioner

Recorder: Jan Brown,¹ Southland Regional Council, executive assistant

- 1 The Environment Court directed in its Minute of 15 April 2019 that expert witness conferencing in respect of water quality and ecology (rivers and wetlands) in relation to the appeals against the proposed Southland Water and Land Plan (**pSWLP**) is to start on Tuesday 7 May 2019 and continue until completed.²

Attendees

- 2 Witnesses who participated and agreed to the content of this Joint Witness Statement (**JWS**):

Name	Employed or engaged by	Signature
Roger Hodson	Southland Regional Council	
Dr Kelvin Lloyd	Southland Regional Council	
Prof Russell Death	Southland Fish and Game Council	

¹ Or equivalent staff member from Council executive administrative team.

² Minute of the Environment Court dated 15 April 2019 at [10(c)], and the Amended Notice of Expert Conferencing dated 18 April 2019.

Kathryn McArthur	Royal Forest and Bird Protection Society of New Zealand	
Dr Jane Kitson	Ngā Rūnanga ³	
Dr Mark James	Meridian Energy Limited	
Justin Kitto	DairyNZ Limited and Fonterra Co-operative Group	
Susan Bennett	Territorial Authorities ⁴	
Emily Funnell	Director-General of Conservation	
Brian Rance	Director-General of Conservation	

Environment Court Practice Note

- 3 All participants confirm that they have read the Environment Court Consolidated Practice Note 2014 and in particular Section 7 (Code of Conduct, Duty to the Court and Evidence of an expert witness) and Appendix 3 - Protocol for Expert Witness Conferences and agree to abide by it.
- 4 Mr Kitto acknowledges in his evidence that he is an employee of DairyNZ, which is a party to this proceeding, and that he may not be considered to be independent simply because of that employee status. Notwithstanding that, he confirms that he prepared and will present his evidence in all other respects as an independent expert and in compliance with the Code of Conduct.
- 5 Ms Funnell acknowledges in her evidence that she is employed by the Department of Conservation, and while the Department has an advocacy function under the Conservation Act 1987, her role in preparing and giving this evidence is as an independent expert. She

³ Comprising Waihopai Rūnaka, Hokonui Rūnaka, Te Rūnanga o Awarua, Te Rūnanga o Oraka Aparima, and Te Rūnanga o Ngāi Tahu.

⁴ Comprising Gore District Council, Southland District Council, and Invercargill City Council.

goes on to state that she is authorised to provide any evidence that is within her expertise which goes outside the Department's advocacy function.

- 6 Mr Rance also acknowledges in his evidence that he is employed by the Department of Conservation, and while the Department has an advocacy function under the Conservation Act 1987, his role in preparing and giving this evidence is as an independent expert. He goes on to state that he is authorised to provide any evidence that is within his expertise which goes outside the Department's advocacy function.
- 7 Mr Hodson acknowledges that he is an employee of the Respondent, Southland Regional Council. Notwithstanding that, Mr Hodson confirms that he prepared and will present his evidence as an independent expert and in compliance with the Code of Conduct.

Experts' qualifications and experience

- 8 These are set out in each experts' statement of evidence.

Purpose of expert conference

- 9 The purpose of the conferencing is to, if possible, narrow the issues as between the experts thereby streamlining the hearing. Another potential advantage of conferencing is that the joint witness statement can, if comprehensive, stand-in for rebuttal evidence.
- 10 The experts will assist the court by responding to a series of questions agreed by counsel and experts relating to river water quality and ecology and associated issues that the court may wish to consider when determining the appeals. For each question, the experts are to state matters on which they agree and on which they do not agree, with reasons.

Key information sources relied on

- 11 The experts relied on the following key sources of information [noting that this list is a draft, to be amended as necessary by the experts]:

- (a) Environment Southland, 2000, Southlands' State of the Environment report for Water – October 2000. Environment Southland Publication Number 2000-21. ISBN Number: 0-909043-16-7.
- (b) Environment Southland and Te Ao Marama Incorporated, 2010. Our Health: Is our water safe to play in, drink and gather kai from? Part 1 of Southland Water 2010: Report on the State of Southlands Freshwater
- (c) Snelder, T., Fraser, C., Hodson, R., Ward, N., Rissmann, C., Hicks, A., 2014. *Regional Scale Stratification of Southland's Water Quality – Guidance for Water and Land Management*. Prepared for southland regional council by Aqualinc Research Limited, Report No: C13055/22, March 2014.
- (d) Environment Southland, 2016(b), *Water Quality in Southland*, <http://www.es.govt.nz/Document%20Library/Factsheets/Other%20factsheets/Water%20Quality%20in%20Southland%20web.pdf>
- (e) Kitto, J. and Hodson, R.J.W. 2016, Water quality state and trends for southland. Dairy New Zealand Poster. 2016 New Zealand Fresh Water Conference Proceedings, Invercargill.
- (f) Hodson, R. and Akbaripasand, A., 2016. *State and Trends in Freshwater Macroinvertebrate Community Health in Southland*. New Zealand Fresh Water Conference Proceedings, Invercargill. <http://www.es.govt.nz/Document%20Library/Presentations/Science%20Conference%20Posters%202016/State%20and%20Trends%20in%20Freshwater%20Macroinvertebrate%20Community%20Health%20in%20Southland.pdf>
- (g) Hodson R., Dare J., Merg M., Couldrey, M. (2017), *Water Quality in Southland: Current State and Trends*. Environment Southland publication No: 2017-04.
- (h) Australian and New Zealand Environment and conservation Council. 2000. Australia and New Zealand guidelines for fresh and marine water quality. Townsville: Environment Australia
- (i) Ausseil A-G.E., Gerbeaux P., Chadderton W.L., Stephens T., Brown D., and Leathwick J. 2008: *Wetland ecosystems of national importance for biodiversity: criteria, methods, and candidate list of*

nationally important inland wetlands. Landcare Research Contract Report LC0708/158. Prepared for the Department of Conservation.

- (j) Hodson R., De Silva N. 2018. Assessing the State of Periphyton in Southland Streams and Rivers. Environment Southland publication No: 2018-19
 - (k) LAWA 2018 www.lawa.org.nz
 - (l) McAllister, T.G., Wood, S.A., and Hawes, I. 2016, The rise of toxic benthic Phormidium proliferations: A review of their taxonomy, distribution, toxin content and factors regulating prevalence and increased severity. Harmfull algae, vol. 55, 282-294
 - (m) Stark JD, Maxted JR 2007. A user guide for the Macroinvertebrate Community Index. Prepared for the Ministry for the Environment. Cawthron Report No.1166. 58 p.
 - (n) New Zealand Government (2017). National Policy Statement for Freshwater Management 2014 updated August 2017 to incorporate amendments from the National Policy Statement for Freshwater Amendment Order 2017
- 12 A map of the Southland Region, including major surface water bodies, is attached as **Appendix A**.⁵

Proposed plan provisions relevant to this conference

- 13 The following plan provisions are relevant (at a high-level) to this conference, and have been included as directed by the Court.⁶ Note that the plan provisions themselves are not a topic/issue for the experts to consider.
- (a) Te Mana o te Wai (page 5 of the Appeals version of the pSWLP).
 - (b) Purpose and Framework (page 7 of the Appeals version of the pSWLP).
 - (c) Issues:

⁵ From the Statement of Evidence of Roger Hodson dated 14 December 2018 at Appendix 1.

⁶ Minute of the Environment Court dated 2 April 2019 (on conferencing) at [7(v)].

- (i) Water quality (page 15 of the Appeals version of the pSWLP).
 - (ii) Surface Water (page 16 of the Appeals version of the pSWLP).
 - (iii) Indigenous Biodiversity (page 17 of the Appeals version of the pSWLP).
- (d) Objectives 1 (noting this objective is not subject to appeal), 3 (noting this objective is not subject to appeal), 6, 7, 14 and 15 (noting this objective is not subject to appeal).
 - (e) Policies 45 and 47.
 - (f) Appendix E (noting that the content of Appendix E is outside the scope of the hearing on Topic A and is to be considered as part of the hearing on Topic B).

Definitions

- 14 Any definitions required for the purpose of this conference, in light of the issues to be discussed below (to be completed by the experts referring to the proposed plan definitions were possible), including but not limited to [noting that this list is a draft, to be amended as necessary by the experts]:
- (a) Ecosystem health – the biophysical condition of a freshwater ecosystem, akin to life supporting capacity, which may utilise multiple indicators to assess.
 - (b) Enhancement or improvement of water quality – a statistically significant decrease in concentration of a contaminant, increase in clarity or MCI score.
 - (c) Excessive periphyton growth – filamentous or matt algae percentage aerial cover or benthic chlorophyll-a which is in excess of a numerical standard or attribute objective. Filamentous cover > 30% or diatom and matt algae > 60% or benthic chlorophyll-a > 200 mgm².
 - (d) Macroinvertebrates - small aquatic animals without a back-bone or spine that can be caught by using a 500µm net or sieve (i.e. visible

to the naked eye without using a microscope), such as insect larvae, worms and snails.

- (e) Maintenance (of water quality) – the situation where there is no deterioration of an indicator through either time series analysis or assessment of a parameter within an accepted range of variation or attribute band.
 - (f) MCI - Macroinvertebrate Community Index, which is a tool for assessing water quality. Different macroinvertebrate taxa are assigned a tolerance score based on their tolerance to contaminants. The index is then calculated by summing the scores for all species present at a site.
 - (g) Over-allocation - the use of a resource beyond a numeric threshold.
 - (h) Periphyton – non-vascular plants forming crusts, films or filamentous mats on plants or beds of watercourses.
 - (i) QMCI – Quantitative Macroinvertebrate Community Index.
 - (j) SQMCI – Semi-quantitative Macroinvertebrate Community Index.
 - (k) Parameters – the numerical statistic used to summarise sample data e.g. mean, median, 95th percentile, and could include an indicator specific minimum sample size, sample frequency and time period.
 - (l) Indicators – a variable, attribute, or contaminant such as a chemical or biological property which is measurable as a concentration or index score.
- 15 What does “overall” water quality mean to a freshwater scientist? – a water quality index used to combine multiple indicators of water quality to a single scale using a repeatable methodology.

Issues to be considered

- 16 The conference will address the issues as follows. These agenda items are provided to guide the relevant expert witnesses on matters where the evidence appears to be in dispute, but the experts should use their judgment to discuss and record their positions on the matters that they

consider relevant arising out of the evidence and the discussions on the day.

Description of the Southland region aquatic environment

- 17 An overview of Southland's surface water bodies is provided in paragraphs 14 to 23 of the evidence of Mr Hodson. The other experts are in general **agreement/disagreement** with this overview.

Current state of freshwater ecology in Southland, including:

- 18 What are the important features of Southland's freshwater ecology?
- (a) Is it degraded?
 - (b) If so, how?
 - (c) Is this related to water quality or some other factor (e.g. water quantity)?

Current state of water quality in Southland, including:

- 19 What are the key contaminants that need to be considered?

The experts agree that the following contaminants need to be considered:

(a) Experts to list

Experts to explain why the contaminants are important and state any disagreements

- 20 What are the key parameters for assessing water quality in Southland (if not addressed above)?
- 21 What are the key indicators to assess ecosystem health in Southland (if not addressed above)?
- 22 What is the spatial scale that should be used for assessing water quality parameters (e.g. specific sites, waterbodies, FMUs, whole catchments)?
- 23 What is missing from the monitoring that would be appropriate to inform the current state of health of Southland's waterbodies (including for human health and cultural health)?
- 24 What is the understood current state of Southland's freshwater and associated water bodies?

25 How does the state of Southland's water bodies compare to the rest of Aotearoa / New Zealand?

(a) Is this a meaningful and/or useful comparison?

Effectiveness of the approach to managing current and future activities

26 Will the approach to managing current and future activities that contribute to degradation of freshwater quality be sufficient to maintain or improve freshwater quality throughout the region?

Note that while the experts can express their views on the effectiveness of the plan provisions, this should only be in their capacity as freshwater science experts and noting the limited scope of the Topic A hearing (i.e. that the rules are not part of this hearing/conference).

27 In light of the discussions on item 26 above:

(a) Why is Southland's water quality declining?

(b) What does that mean for people and ecosystems?

(c) What needs to be done about it?

Note that these questions are to be addressed taking into account scientific considerations only, and not planning and legal considerations.

28 To the extent that these issues have not been addressed above, do the experts agree or disagree on the following topics with respect to Southland's water bodies:

(a) Over-allocation;

(b) Human health;

(c) Mahinga kai;

(d) Cultural indicator;

(e) Threatened Species;

(f) Toxicity;

(g) Inter-relationship with groundwater and surface water quantity; and

(h) Climate change.

Monitoring / trend analysis

- 29 What is the relationship between trends and the state of sites?
- 30 What time period is most appropriate for trend analysis and why?
- 31 What trend analysis is more useful - LAWA vs Environment Southland State of Environment Monitoring report (or both)?
- 32 Do comparisons against surface water quality standards in the Regional Water Plan as well as the bands in the NPSFM and ANZECC guidelines to assess ecological health understate the level of degradation, and are the causes of degradation able to be understood?

Indicators of ecosystem health, including:

- 33 Which of MCI, QMCI or SQMCI are the most appropriate indicators of invertebrate community health in Southland's waterbodies?
- 34 Can, and if so what, numeric values for the indicators in question 21 would safeguard ecosystem health?
- 35 Can region wide nitrate nitrogen, dissolved reactive phosphorus and deposited sediment attribute states be set in order to safeguard ecosystem health?

If yes:

- (a) What are the risks and uncertainties of doing so?
- (b) What is the relationship between nutrient concentrations and macroinvertebrate and periphyton health?
- (c) Can national models or data sets be used?
- (d) Can, and if so how should, the numeric values be measured?
- (e) Do the waterbodies across the region have different characteristics requiring adjustments to be made to the region-wide indicators?
- (f) How can in-stream attribute states provide guidance regarding discharges from individual activities/properties?

If no:

- (g) Why not?
- (h) What (if any) further information or additional work would be required to make region-wide numeric indicators effective?

- (i) Can such additional work (if any) be undertaken by expert scientists, and in what timeframe?
- 36 Is it appropriate to set region wide numeric values ahead of determining where, how, and when such numeric values will be measured?
- 37 How are any region wide numeric values for ecosystem health to be adjusted to provide for exceptions, such as the effects of didymo in the Waiau FMU?

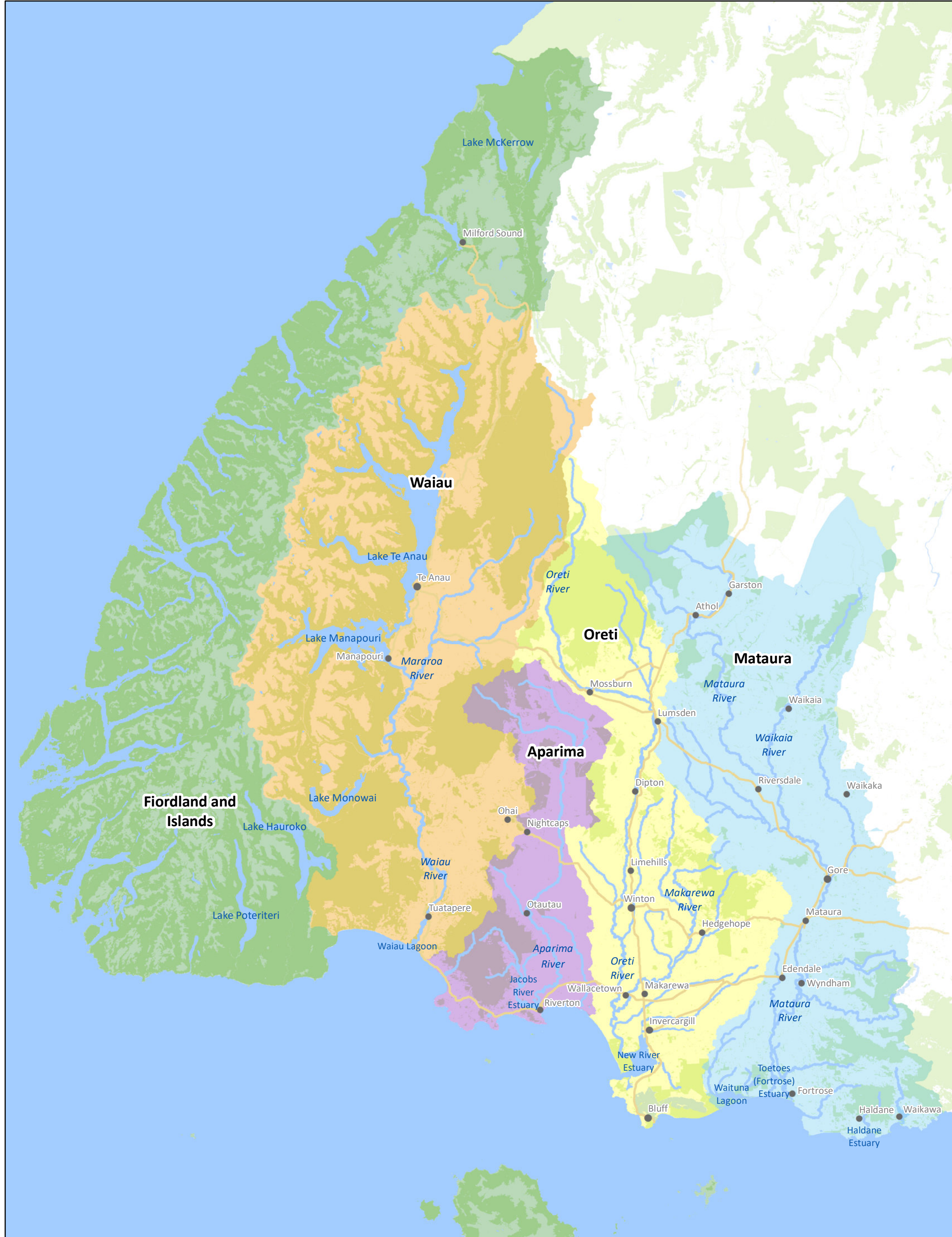
Note: the above topics (where relevant) are limited to the theoretical question as to whether the limits proposed might be appropriate in the Southland Region (having regard to the unique characteristics of this region), and the scope of the caucusing expressly excludes the question of whether those limits should be imposed in this regional plan (or through some future FMU process), and if so, what those limits should be.

Joint Expert Witness Statement

- 38 The experts must produce a joint expert witness statement stating their findings and conclusions, along with reasons why, for each of the issues included in this agenda.
- 39 In the event of any disagreement on any matter, the joint statement should identify the expert witnesses in agreement and the expert witnesses in disagreement. The expert witnesses in disagreement on any matters should record their reasons for any disagreement.
- 40 The joint expert witness statement is to be completed, signed by all expert witnesses and dated at the end of the conference, unless otherwise agreed by Commissioner Hodges (in which case it is to be signed as soon as possible following the close of the conference), and filed with the Court by Friday 10 May 2019.⁷

⁷ Minute of the Environment Court dated 23 April 2019 at [3(a)]; Amended Notice of Expert Witness Conference dated 18 April 2019.


**Appendix A
Map of Southland Region,
including major surface water
bodies**



**Southland
New Zealand**

Date: 5/12/2018

- State Highways
- Rivers
- Vegetation
- Fresh Water Management Units**
- Aparima
- Fiordland and Islands
- Mataura
- Oreti
- Waiau


1:800,000

DISCLAIMER
 Environment Southland uses reasonable endeavours but does not warrant that this information is current, complete or accurate. Professional or specialist advice should be obtained before taking or refraining from taking any action on the basis of this information. To the extent permitted by law, Environment Southland will not be liable for any loss, liability or costs suffered or incurred as a result of any reliance placed on this information

DATA SOURCE: ES GIS 2018

Appendix 2 – copy of agenda showing changes from draft to final

EXPERT CONFERENCE —WATER QUALITY AND ECOLOGY (RIVERS & WETLANDS)

ENV-2018-CHC — 026, 29, 37, 38, 39, 40, 41, 47, 50

Various s274 parties

Topic: Proposed Southland Water and Land Plan - Southland Regional Council

Date: Tuesday, 7 May 2019 – Wednesday, 8 May 2019

Time: 09:00 AM

Venue: Conference Room, Kelvin Hotel, 20 Kelvin Street, Invercargill

Facilitator: Jim Hodges, Environment Commissioner

Recorder: Jan Brown,¹ Southland Regional Council, executive assistant

1 The Environment Court directed in its Minute of 15 April 2019 that expert witness conferencing in respect of water quality and ecology (rivers and wetlands) in relation to the appeals against the proposed Southland Water and Land Plan (**pSWLP**) is to start on Tuesday 7 May 2019 and continue until completed.²

~~2 The conferencing will be facilitated by Commissioner Hodges.~~

~~3 Jan Brown will also attend the conference in the capacity as recorder, to assist with the preparation of the Joint Witness Statement under the direction of the experts and the Commissioner.~~

Attendees

~~42 The conferencing on surface water quality and freshwater ecology, specifically in relation to rivers and wetlands, will involve the following experts: Witnesses who participated and agreed to the content of this Joint Witness Statement (**JWS**):~~

¹ ~~Or equivalent staff member from Council executive administrative team.~~

² Minute of the Environment Court dated 15 April 2019 at [10(c)], and the Amended Notice of Expert Conferencing dated 18 April 2019.

<u>Name</u>	<u>Employed or engaged by</u>	<u>Signature</u>
<u>Roger Hodson</u>	<u>Southland Regional Council</u>	
<u>Dr Kelvin Lloyd</u>	<u>Southland Regional Council</u>	
<u>Prof Russell Death</u>	<u>Southland Fish and Game Council</u>	
<u>Kathryn McArthur</u>	<u>Royal Forest and Bird Protection Society of New Zealand</u>	
<u>Dr Jane Kitson</u>	<u>Ngā Rūnanga³</u>	
<u>Dr Mark James</u>	<u>Meridian Energy Limited</u>	
<u>Justin Kitto</u>	<u>DairyNZ Limited and Fonterra Co-operative Group</u>	
<u>Susan Bennett</u>	<u>Territorial Authorities⁴</u>	
<u>Emily Funnell</u>	<u>Director-General of Conservation</u>	
<u>Brian Rance</u>	<u>Director-General of Conservation</u>	

~~Roger Hodson (for Southland Regional Council);~~

~~Dr Kelvin Lloyd (for Southland Regional Council);~~

~~Prof Russell Death (for Southland Fish and Game Council);~~

~~Kathryn McArthur (for Royal Forest and Bird Protection Society of New Zealand);~~

~~Dr Jane Kitson (for Ngā Rūnanga⁵);~~

~~Dr Mark James (for Meridian);~~

~~Justin Kitto (for DairyNZ Limited and Fonterra Co-operative Group);~~

³ Comprising Waihopai Rūnaka, Hokonui Rūnaka, Te Rūnanga o Awarua, Te Rūnanga o Oraka Aparima, and Te Rūnanga o Ngāi Tahu.

⁴ Comprising Gore District Council, Southland District Council, and Invercargill City Council.

⁵ Comprising Waihopai Rūnaka, Hokonui Rūnaka, Te Rūnanga o Awarua, Te Rūnanga o Oraka Aparima, and Te Rūnanga o Ngāi Tahu.

~~Susan Bennett (for the Territorial Authorities⁶);~~

~~Emily Funnell (for Director-General of Conservation); and~~

~~Brian Rance (for Director-General of Conservation).~~

Environment Court Practice Note

- 53** All participants confirm that they have read the Environment Court Consolidated Practice Note 2014 and in particular Section 7 (Code of Conduct, Duty to the Court and Evidence of an expert witness) and Appendix 3 - Protocol for Expert Witness Conferences and agree to abide by it.
- 64** Mr Kitto acknowledges in his evidence that he is an employee of DairyNZ, which is a party to this proceeding, and that he may not be considered to be independent simply because of that employee status. Notwithstanding that, he confirms that he prepared and will present his evidence in all other respects as an independent expert and in compliance with the Code of Conduct.
- 75** Ms Funnell acknowledges in her evidence that she is employed by the Department of Conservation, and while the Department has an advocacy function under the Conservation Act 1987, her role in preparing and giving this evidence is as an independent expert. She goes on to state that she is authorised to provide any evidence that is within her expertise which goes outside the Department's advocacy function.
- 86** Mr Rance also acknowledges in his evidence that he is employed by the Department of Conservation, and while the Department has an advocacy function under the Conservation Act 1987, his role in preparing and giving this evidence is as an independent expert. He goes on to state that he is authorised to provide any evidence that is within his expertise which goes outside the Department's advocacy function.
- 97** Mr Hodson acknowledges that he is an employee of the Respondent, Southland Regional Council. Notwithstanding that, Mr Hodson confirms

⁶ Comprising Gore District Council, Southland District Council, and Invercargill City Council.

that he prepared and will present his evidence as an independent expert and in compliance with the Code of Conduct.

Experts' qualifications and experience

408 These are set out in each experts' statement of evidence.

Purpose of expert conference

419 The purpose of the conferencing is to, if possible, narrow the issues as between the experts thereby streamlining the hearing. Another potential advantage of conferencing is that the joint witness statement can, if comprehensive, stand-in for rebuttal evidence.

4210 The experts will assist the court by responding to a series of questions agreed by counsel and experts relating to river water quality and ecology and associated issues that the court may wish to consider when determining the appeals. For each question, the experts are to state matters on which they agree and on which they do not agree, with reasons.

Key information sources relied on

4311 The experts relied on the following key sources of information [noting that this list is a draft, to be amended as necessary by the experts]:

- (a) Environment Southland, 2000, Southlands' State of the Environment report for Water – October 2000. Environment Southland Publication Number 2000-21. ISBN Number: 0-909043-16-7.
- (b) Environment Southland and Te Ao Marama Incorporated, 2010. Our Health: Is our water safe to play in, drink and gather kai from? Part 1 of Southland Water 2010: Report on the State of Southlands Freshwater
- (c) Snelder, T., Fraser, C., Hodson, R., Ward, N., Rissmann, C., Hicks, A., 2014. Regional Scale Stratification of Southland's Water Quality – Guidance for Water and Land Management. Prepared for

- southland regional council by Aqualinc Research Limited, Report No: C13055/22, March 2014.
- (d) Environment Southland, 2016(b), *Water Quality in Southland*, <http://www.es.govt.nz/Document%20Library/Factsheets/Other%20of%20actsheets/Water%20Quality%20in%20Southland%20web.pdf>
- (e) Kitto, J. and Hodson, R.J.W. 2016, Water quality state and trends for southland. Dairy New Zealand Poster. 2016 New Zealand Fresh Water Conference Proceedings, Invercargill.
- (f) Hodson, R. and Akbaripasand, A., 2016. *State and Trends in Freshwater Macroinvertebrate Community Health in Southland*. New Zealand Fresh Water Conference Proceedings, Invercargill. <http://www.es.govt.nz/Document%20Library/Presentations/Science%20Conference%20Posters%202016/State%20and%20Trends%20in%20Freshwater%20Macroinvertebrate%20Community%20Health%20in%20Southland.pdf>
- (g) Hodson R., Dare J., Merg M., Couldrey, M. (2017), *Water Quality in Southland: Current State and Trends*. Environment Southland publication No: 2017-04.
- (h) Australian and New Zealand Environment and conservation Council. 2000. *Australia and New Zealand guidelines for fresh and marine water quality*. Townsville: Environment Australia
- (i) Ausseil A-G.E., Gerbeaux P., Chadderton W.L., Stephens T., Brown D., and Leathwick J. 2008: *Wetland ecosystems of national importance for biodiversity: criteria, methods, and candidate list of nationally important inland wetlands*. Landcare Research Contract Report LC0708/158. Prepared for the Department of Conservation.
- (j) Hodson R., De Silva N. 2018. *Assessing the State of Periphyton in Southland Streams and Rivers*. Environment Southland publication No: 2018-19
- (k) LAWA 2018 www.lawa.org.nz
- (l) McAllister, T.G., Wood, S.A., and Hawes, I. 2016, *The rise of toxic benthic Phormidium proliferations: A review of their taxonomy, distribution, toxin content and factors regulating prevalence and increased severity*. *Harmful algae*, vol. 55, 282-294

(m) Stark JD, Maxted JR 2007. A user guide for the Macroinvertebrate Community Index. Prepared for the Ministry for the Environment. Cawthron Report No.1166. 58 p.

(n) New Zealand Government (2017). National Policy Statement for Freshwater Management 2014 updated August 2017 to incorporate amendments from the National Policy Statement for Freshwater Amendment Order 2017~~To be completed by the experts~~

4412 A map of the Southland Region, including major surface water bodies, is attached as **Appendix A.**⁷

Proposed plan provisions relevant to this conference

=====The following plan provisions are relevant (at a high-level) to this conference, and have been included as directed by the Court.⁸ Note that the plan provisions themselves are not a topic/issue for the experts to consider.

4513

- (a) Te Mana o te Wai (page 5 of the Appeals version of the pSWLP).
- (b) Purpose and Framework (page 7 of the Appeals version of the pSWLP).
- (c) Issues:
 - (i) Water quality (page 15 of the Appeals version of the pSWLP).
 - (ii) Surface Water (page 16 of the Appeals version of the pSWLP).
 - (iii) Indigenous Biodiversity (page 17 of the Appeals version of the pSWLP).

⁷ From the Statement of Evidence of Roger Hodson dated 14 December 2018 at Appendix 1.

⁸ Minute of the Environment Court dated 2 April 2019 (on conferencing) at [7(v)].

- (d) Objectives 1 (noting this objective is not subject to appeal), 3 (noting this objective is not subject to appeal), 6, 7, 14 and 15 (noting this objective is not subject to appeal).
- (e) Policies 45 and 47.
- (f) Appendix E (noting that the content of Appendix E is outside the scope of the hearing on Topic A and is to be considered as part of the hearing on Topic B).

~~161 Note that the plan provisions themselves are not a topic/issue for the experts to consider.~~

Definitions

1714 Any definitions required for the purpose of this conference, in light of the issues to be discussed below (to be completed by the experts referring to the proposed plan definitions were possible), including but not limited to noting that this list is a draft, to be amended as necessary by the experts:

- (a) Ecosystem health – the biophysical condition of a freshwater ecosystem, akin to life supporting capacity, which may utilise multiple indicators to assess.
- (b) Enhancement or improvement of water quality – a statistically significant decrease in concentration of a contaminant, increase in clarity or MCI score.
- (c) Excessive periphyton growth – filamentous or matt algae percentage aerial cover or benthic chlorophyll-a which is in excess of a numerical standard or attribute objective. Filamentous cover > 30% or diatom and matt algae > 60% or benthic chlorophyll-a > 200 mgm².
- (d) Macroinvertebrates - small aquatic animals without a back-bone or spine that can be caught by using a 500µm net or sieve (i.e. visible to the naked eye without using a microscope), such as insect larvae, worms and snails.
- (e) Maintenance (of water quality) – the situation where there is no deterioration of an indicator through either time series analysis or

assessment of a parameter within an accepted range of variation or attribute band.

- (f) MCI - Macroinvertebrate Community Index, which is a tool for assessing water quality. Different macroinvertebrate taxa are assigned a tolerance score based on their tolerance to contaminants. The index is then calculated by summing the scores for all species present at a site.
- (g) Over-allocation - the use of a resource beyond a numeric threshold.
- (h) Periphyton – non-vascular plants forming crusts, films or filamentous mats on plants or beds of watercourses.
- (i) QMCI – Quantitative Macroinvertebrate Community Index.
- (j) SQMCI – Semi-quantitative Macroinvertebrate Community Index.
- (k) Parameters – the numerical statistic used to summarise sample data e.g. mean, median, 95th percentile, and could include an indicator specific minimum sample size, sample frequency and time period.
- (l) Indicators – a variable, attribute, or contaminant such as a chemical or biological property which is measurable as a concentration or index score.

4815 What does “overall” water quality mean to a freshwater scientist? – a water quality index used to combine multiple indicators of water quality to a single scale using a repeatable methodology.

Issues to be considered

4916 The conference will address the issues as follows. These agenda items are provided to guide the relevant expert witnesses on matters where the evidence appears to be in dispute, but the experts should use their judgment to discuss and record their positions on the matters that they consider relevant arising out of the evidence and the discussions on the day.

Description of the Southland region aquatic environment

2017 An overview of Southland's surface water bodies is provided in paragraphs 14 to 23 of the evidence of Mr Hodson. The other experts are in general **agreement/disagreement** with this overview.

Current state of freshwater ecology in Southland, including:

2418 What are the important features of Southland's freshwater ecology?

- (a) Is it degraded?
- (b) If so, how?
- (c) Is this related to water quality or some other factor (e.g. water quantity)?

Current state of water quality in Southland, including:

2219 What are the key contaminants that need to be considered?

The experts agree that the following contaminants need to be considered:

(a) Experts to list

Experts to explain why the contaminants are important and state any disagreements

2320 What are the key parameters for assessing water quality in Southland (if not addressed above)?

2421 What are the key indicators to assess ecosystem health in Southland (if not addressed above)?

2522 What is the spatial scale that should be used for assessing water quality parameters (e.g. specific sites, waterbodies, FMUs, whole catchments)?

2623 What is missing from the monitoring that would be appropriate to inform the current state of health of Southland's waterbodies (including for human health and cultural health)?

2724 What is the understood current state of Southland's freshwater and associated water bodies?

~~281 Will the approach to managing current and future activities that contribute to degradation of freshwater quality be sufficient to maintain or improve freshwater quality throughout the region?~~

2925 How does the state of Southland's water bodies compare to the rest of Aotearoa / New Zealand?

(a) Is this a meaningful and/or useful comparison?

Effectiveness of the approach to managing current and future activities

26 Will the approach to managing current and future activities that contribute to degradation of freshwater quality be sufficient to maintain or improve freshwater quality throughout the region?

Note that while the experts can express their views on the effectiveness of the plan provisions, this should only be in their capacity as freshwater science experts and noting the limited scope of the Topic A hearing (i.e. that the rules are not part of this hearing/conference).

27 In light of the discussions on item 26 above:

(a) Why is Southland's water quality declining?

(b) What does that mean for people and ecosystems?

(c) What needs to be done about it?

Note that these questions are to be addressed taking into account scientific considerations only, and not planning and legal considerations.

28 To the extent that these issues have not been addressed above, do the experts agree or disagree on the following topics with respect to Southland's water bodies:

(a) Over-allocation;

(b) Human health;

(c) Mahinga kai;

(d) Cultural indicator;

(e) Threatened Species;

(f) Toxicity;

(g) Inter-relationship with groundwater and surface water quantity; and

(b) Climate change.

(h)

Monitoring / trend analysis

3029 What is the relationship between trends and the state of sites?

3430 What time period is most appropriate for trend analysis and why?

3231 What trend analysis is more useful - LAWA vs Environment Southland State of Environment Monitoring report (or both)?

3332 Do comparisons against surface water quality standards in the Regional Water Plan as well as the bands in the NPSFM and ANZECC guidelines to assess ecological health understate the level of degradation, and are the causes of degradation able to be understood?

Indicators of ecosystem health, including:

3433 Which of MCI, QMCI or SQMCI are the most appropriate indicators of invertebrate community health in Southland's waterbodies?

3534 Can, and if so what, numeric values for the indicators in question 213 would safeguard ecosystem health?

3635 Can region wide nitrate nitrogen, dissolved reactive phosphorus and deposited sediment attribute states be set in order to safeguard ecosystem health?

If yes:

(a) What are the risks and uncertainties of doing so?

(b) What is the relationship between nutrient concentrations and macroinvertebrate and periphyton health?

(c) Can national models or data sets be used?

(d) Can, and if so how should, the numeric values be measured?

(e) Do the waterbodies across the region have different characteristics requiring adjustments to be made to the region-wide indicators?

(f) How can in-stream attribute states provide guidance regarding discharges from individual activities/properties?

If no:

~~(e)~~(g) Why not?

~~(f)~~(a) ~~How can in-stream attribute states provide guidance regarding discharges from individual activities/properties?~~

~~(g)~~(h) What (if any) further information or additional work would be required to make region-wide numeric indicators effective?

~~(h)~~(i) Can such additional work (if any) be undertaken by expert scientists, and in what timeframe?

3736 Is it appropriate to set region wide numeric values ahead of determining where, how, and when such numeric values will be measured?

3837 How are any region wide numeric values for ecosystem health to be adjusted to provide for exceptions, such as the effects of didymo in the Waiau FMU?

Note: the above topics (where relevant) are limited to the theoretical question as to whether the limits proposed might be appropriate in the Southland Region (having regard to the unique characteristics of this region), and the scope of the caucusing expressly excludes the question of whether those limits should be imposed in this regional plan (or through some future FMU process), and if so, what those limits should be.

Joint Expert Witness Statement

3938 The experts must produce a joint expert witness statement stating their findings and conclusions, along with reasons why, for each of the issues included in this agenda.

4039 In the event of any disagreement on any matter, the joint statement should identify the expert witnesses in agreement and the expert witnesses in disagreement. The expert witnesses in disagreement on any matters should record their reasons for any disagreement.

4140 The joint expert witness statement is to be completed, signed by all expert witnesses and dated at the end of the conference, unless otherwise agreed by Commissioner Hodges (in which case it is to be

signed as soon as possible following the close of the conference), and filed with the Court by Friday 10 May 2019.⁹

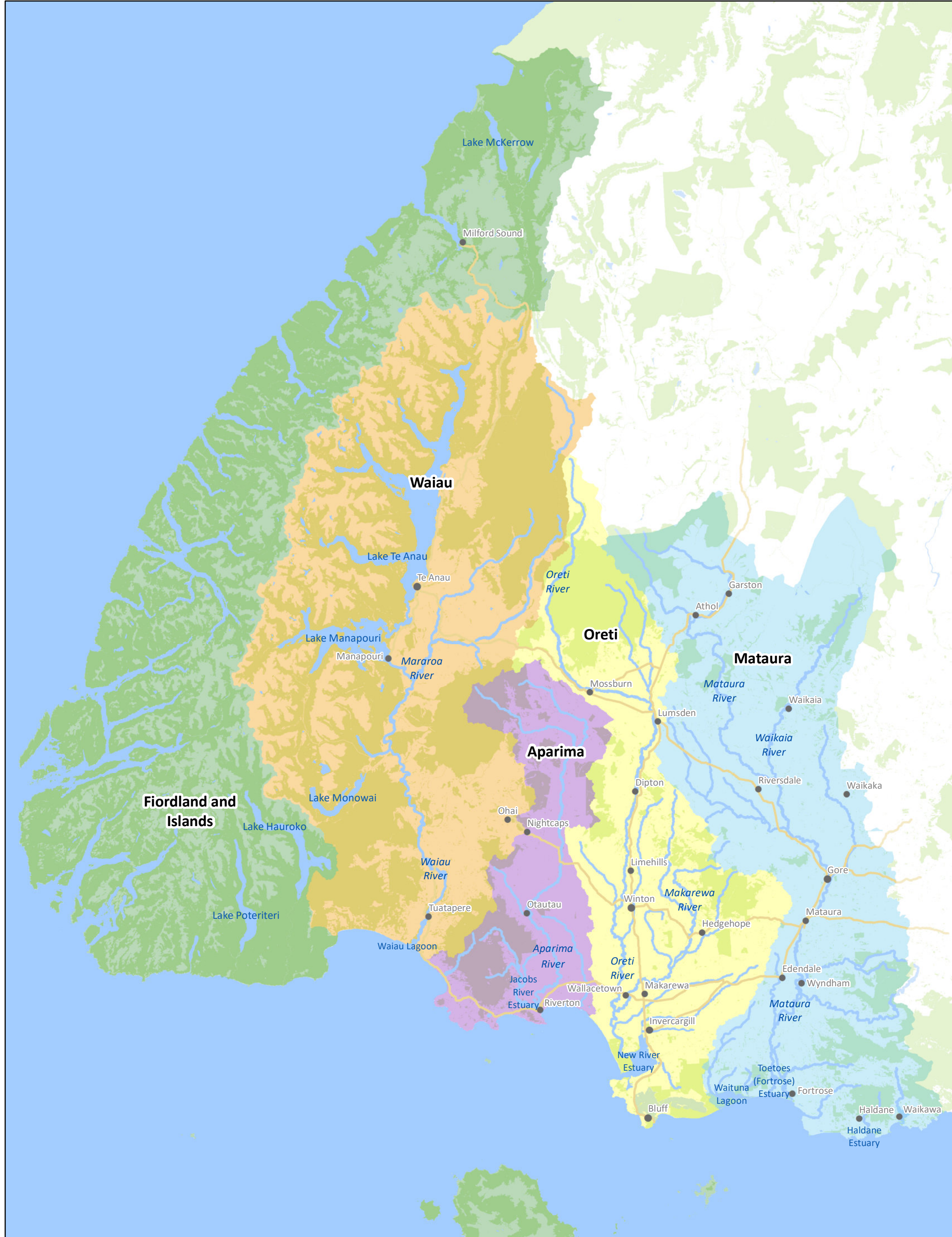
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Draft

⁹ Minute of the Environment Court dated 23 April 2019 at [3(a)]; Amended Notice of Expert Witness Conference dated 18 April 2019.

Appendix A
Map of Southland Region,
including major surfacewater
bodies


Draft



**Southland
New Zealand**

Date: 5/12/2018

- State Highways
- Rivers
- Vegetation
- Fresh Water Management Units**
- Aparima
- Fiordland and Islands
- Mataura
- Oreti
- Waiau


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DATA SOURCE: ES GIS 2018