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Subject: Plan Change 7: Adaptive Management Working Group (PC7-385) - Evidence in Chief
Date: Friday, 17 July 2020 5:11:43 pm
Attachments: [Evidence in Chief of Judy Blakemore \(AMWG\) 17.7.20.pdf](#)
[Evidence in Chief of Mark Webb \(AMWG\) 17.7.20.pdf](#)
[Evidence in Chief of Andrew Mockford \(AMWG\) 17.7.20.pdf](#)
[Evidence in Chief of Julia Crossman \(AMWG\) 17.7.20.pdf](#)
[Evidence in Chief of Dr Gregory Ryder \(AMWG & OWL\) 17.7.20.pdf](#)
[Evidence in Chief of Richard Measures \(AMWG\) 17.7.20.pdf](#)
[Evidence in Chief of Tim Kerr \(AMWG\) 17.7.20.pdf](#)
[Evidence in Chief of Tim Ensor \(AMWG\) 17.7.20.pdf](#)

Dear Tavisha

We act for the Adaptive Management Working Group (**AMWG**), submitter no. PC7-385.

We **attach** for filing, in relation to the above matter, statements of evidence in chief of the following witnesses on behalf of the AMWG:

1. Judy Blakemore (AMWG representative – Timaru District Council)
2. Mark Webb (AMWG representative – Fish and Game)
3. Andrew Mockford (AMWG representative - Opuha Water Limited)
4. Julia Crossman (AMWG representative - Opuha Water Limited)
5. Greg Ryder (ecology/freshwater quality) – please note that this statement of evidence also addresses matters pertaining to Opuha Water Limited's (OWL's) submission on PC7 and has been filed with the evidence of other OWL witnesses today).
6. Richard Measures (artificial freshes)
7. Tim Kerr (modelling)
8. Tim Ensor (planning)

Kind regards,

Georgina Hamilton
Partner



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**BEFORE INDEPENDANT HEARING COMMISSIONERS
APPOINTED BY THE CANTERBURY REGIONAL COUNCIL**

UNDER: the Resource Management Act 1991

IN THE MATTER OF: Proposed Plan Change 7 to the
Canterbury Land and Water Regional
Plan – Section 14: Orari-Temuka-Opihi-
Pareora

**STATEMENT OF EVIDENCE OF JUDY BLAKEMORE ON BEHALF OF
THE ADAPTIVE MANAGEMENT WORKING GROUP (SUBMITTER NO. PC7-385)**

Dated: 17 July 2020

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1. INTRODUCTION

- 1.1 My full name is Judy Cassandra Blakemore.
- 1.2 I am Timaru District Council's (**TDC's**) Water Supply Operations Engineer. In this role, I have the responsibility of managing the TDC's water supply takes, treatment, pumping and sewer treatment. I have worked for TDC and its predecessors within the water sector for 38 years, and in this current role for 16 years.
- 1.3 TDC is a member of the Adaptive Management Working Group (**AMWG**). My evidence is provided in my capacity as TDC's representative on the AMWG, but is endorsed by TDC.

Qualifications and experience

- 1.4 I hold a Bachelor of Engineering in Agricultural Engineering from Lincoln College, University of Canterbury. I also hold a Drinking Water Assessor Diploma from the Agricultural Industry Training Organisation.
- 1.5 The Opihi River Regional Plan (**ORRP**) provides for TDC and Mackenzie District Council to have a representative on the Opuha Environmental Flow Release Advisory Group (**OEFRAG**). I have been that representative since OEFRAG's inception 20 years ago, and have held the position of Chair of OEFRAG since 2008.
- 1.6 I have participated in community steering groups that developed the Pareora Catchment Environmental Flow and Allocation Regional Plan and Policies relating to the Orari River Catchment contained in sub-regional section 14.4 of the Canterbury Land and Water Regional Plan (**CLWRP**).

Background

- 1.7 As part of my role at TDC, I have participated in five Catchment Groups including Orari, Upper Opihi, Opuha, Lower Opihi and Waihi – Temuka attending regular meeting since their inception in 2017 and during their involvement in the Healthy Catchments Project lead by the Orari-Temuka-Opihi-Pareora (**OTOP**) Zone Committee.

- 1.8 I have also been TDC's representative on the AMWG and the Flow and Allocation Working Parties established for the Opihi River and the Temuka River including their tributaries during the development phase of the OTOP ZIPA.
- 1.9 I am familiar with the provisions of PC7 to which these proceedings relate. In preparing my evidence, I have reviewed relevant parts of the section 32 Report and the section 42A Report, in addition to:
- (a) The OTOP Zone Implementation Programme Addendum (**ZIPA**);
 - (b) ECan's responses to the Hearings Panel questions (dated 19 June 2020);
 - (c) ECan's Supplementary Report (dated 26 June 2020); and
 - (d) The statements of evidence of the AMWG's other witnesses, Mark Webb, Andrew Mockford, Julia Crossman, Richard Measures, Greg Ryder, Tim Kerr and Tim Ensor.

2. SCOPE OF EVIDENCE

- 2.1 My evidence provides an introduction to OEFrag and the role it has had since 2000 in managing the water resources of the Lake Opuha catchment, together with an overview of the AMWG, the work it has carried out since its formation in late 2016 and its key concerns with PC7. I also comment on aspects of the Section 42A Report and the recommended changes set out in the 26 June 2020 version of Annexure E.1 to that Report.
- 2.2 My evidence is structured as follows:
- (a) Introduction to OEFrag;
 - (b) Background to the AMWG;
 - (c) Overview of the AMWG's key concerns with PC7 and recommendations made in the Section 42A Report;
 - (d) Conclusions.

3. EXECUTIVE SUMMARY

- 3.1 In late 2017, the Central South Island Fish and Game Council (**CSIFGC**), Department of Conservation (**DOC**), Opuha Water Limited (**OWL**) and TDC, all being long-standing participants in the Opuha Environmental Flow Release Advisory Group (OEFrag) established under the ORRP, formed the AMWG with the endorsement of the OTOP Zone Committee. While it was hoped that Te Rūnanga o Arowhenua would also join the AMWG, and their representation and/or input into AMWG workstreams since 2017 has been actively sought, the AMWG understands resourcing has not enabled that to occur.
- 3.2 The Group's primary purpose was to develop the potential elements of an adaptive management regime for the augmentation of the Opihi mainstem/Saleyards Bridge for consideration by the Zone Committee for inclusion in the OTOP ZIPA, and the future PC7. Following an almost 2-year process involving numerous meetings (including with ECan planning and technical staff), extensive data analysis and related technical workstreams (including development of a snow pack estimation model and Lake inflow and Lake storage thresholds) carried out by consultants engaged by OWL for the AMWG, the AMWG submitted its proposal to the OTOP Zone Committee. The OTOP ZIPA subsequently released in December 2018 recommended that PC7 include an adaptive management regime for the augmentation of the Opuha and Opihi Rivers. This recommendation has formed the basis for the augmentation provisions contained in PC7 as notified.
- 3.3 The AMWG is genuinely concerned that the opportunity to address the shortcomings of the ORRP's current Saleyards Bridge minimum flow regime and imbed an effective and adaptive flow regime in the Canterbury Regional Land and Water Plan (**CRLWP**), informed by the knowledge and experience gained by OEFrag members over the last 20 years, would be lost if PC7 was confirmed in either its notified form or as recommended by the authors of the Section 42A Report.
- 3.4 The AMWG has had the benefit of a range of expert advice, which has informed its position on PC7 and the amendments it seeks to PC7. Based on that advice, it is the AMWG's understanding that PC7, and the reporting officers' recommended changes to PC7, would not achieve the outcomes envisaged by

PC7, specifically “*connectivity, ecological health and flow variability*” of the augmented Opuha and Opihi Rivers. The AMWG also expects that without amendment, PC7 would result in the RMA’s water shortage directions continuing to be a common occurrence during water short periods in the Opihi catchment, an outcome that the AMWG does not support and would be contrary to ECan advice and the premise on which the AMWG’s work since 2017 has been predicated.

- 3.5 The AMWG seeks a range of amendments to ensure that the PC7 planning framework is sufficiently flexible to enable the proactive management of Lake Opuha but equally provides a suitable level of certainty for the community about how water management decisions will be made moving forward. The AMWG considers this is also necessary to ensure the range of outcomes envisaged by PC7 are achieved.
- 3.6 The amendments sought by the AMWG include the following, which are set out in more detail in the evidence of the AMWG’s planning witness, Mr Tim Ensor:
- (a) Reinstatement and modification of Policies 14.3.35 – 39;
 - (b) Retention of PC7’s discretionary three tier flow management regime for SYB within Table 14(v), subject to modifications to PC7’s proposed minimum flows, and deletion of Table 14(w);
 - (c) Modifications to the Table 14(x) thresholds, and policies, to enable entry into Level 1 and Level 2 flow regimes (per Table 14(v) as modified) on any day, reduced minimum flows to apply for a minimum of 14 days (or in the alternative, a lesser timeframe), and an exit strategy based on lake levels;
 - (d) An alternative partial restriction regime;
 - (e) Express provision for stakeholder consultation and involvement in decisions by the operator of the Opuha Dam to enter/exit Level 1 and Level 2 flow regimes under the augmentation rule (Rule 14.5.29); and
 - (f) Various minor corrections to errors.

4. OPUHA ENVIRONMENTAL FLOW RELEASE ADVISORY GROUP (OEFRAG)

OEFRAG's primary roles under the ORRP

4.1 OEFRAG was established by the ORRP, which became operative in September 2000. OEFRAG is defined in the ORRP in the following way:¹

Opuha Environmental Flow Release Advisory Group means the group responsible for modifying the environmental release flows within the provisions of the Plan and shall be comprised of the following members:

- (i) a representative of the Opuha Dam Partnership;*
- (ii) one instream representative (appointed jointly by the Department of Conservation and the Central South Island Fish and Game Council),*
- (iii) one Takata Whenua representative, and*
- (iv) one representative of irrigators (appointed by South Canterbury Federated Farmers),*
- (v) one representative of the Timaru and Mackenzie District Councils.*

4.2 As identified by the ORRP definition, OEFRAG's primary role under the ORRP is as an advisory group providing recommendations to the operator of the Opuha Dam, now Opuha Water Limited (**OWL**), on flow releases from the Dam. Specifically, the ORRP allows OEFRAG to make recommendations on:

- (a) releases for artificial freshes and related compensatory flows;
- (a) releases for flood buffering purposes; and
- (b) transitioning between the ORRP's monthly variable minimum flows, and alternative minimum flow regimes, for Saleyards Bridge (**SYB**).

4.3 These roles are codified in OWL's discharge consent for the Opuha Dam, CRC155950. Conditions 6 and 8 of that consent expressly require the written approval of all members of OEFRAG to be provided to ECan before any flow transition, artificial fresh or flood buffering proposal can be implemented.

¹ ORRP, Appendix 1, page 69.
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Membership and operation of OEFRAG

- 4.4 OEFRAG was officially established after the ORRP become operative in September 2000 and since that time has continued to operate in accordance with the ORRP and CRC155950. OEFRAG's current membership comprises:
- (a) OWL representative: Ryan O'Sullivan;
 - (b) CSFIGC/DOC representative: Jay Graybill of CSIFGC;
 - (c) Te Rūnanga o Arowhenua representative: John Henry;
 - (d) Federated Farmers representative: David Williams; and
 - (e) TDC and MDC representative: Judy Blakemore of TDC.
- 4.5 While OEFRAG does not have any formal terms of reference, over time its members have established a strong working relationship that has been underpinned by a high level of trust between each other. Decisions are made by consensus following a robust process of information sharing, and where appropriate, discussion. Issues can be raised, and meetings requested, by any member at any time.
- 4.6 Each member meets the costs of their representatives' involvement in OEFRAG. Technical advice, when needed, is provided to OEFRAG by consultants engaged by OWL. However, for the most part, decisions made by OEFRAG are informed by the knowledge and expertise of its members and/or information/research held by them.
- 4.7 ECan does not have a formal role in OEFRAG's operation and decision-making processes, however, OEFRAG members consult with ECan staff from time to time. For example, ECan's river engineers are usually consulted on artificial fresh proposals given the potential implications of such freshes for the wider Opihi River system, including the Opihi River mouth.

OEFRAG's role in Water Shortage Directions

- 4.8 As noted in ECan's section 32 report for PC7,² over time, OEFRAG's advisory role has evolved beyond that prescribed by the ORRP to include providing recommendations to ECan on the need for Water Shortage Directions (**WSD**) under section 329 of the Resource Management Act 1991 (**RMA**). This additional role of OEFRAG has come about because of shortcomings in the ORRP's minimum flow regime for the mainstem of the Opihi River at SYB.
- 4.9 In his evidence for the AMWG, Mr Mark Webb has provided an overview of the key components of the ORRP regime and the various factors that influenced its development. In summary, the ORRP prescribes different minimum flow requirements at SYB and partial restrictions for consented abstraction as the level of water within Lake Opuha reduces, as set out in the table below:

Minimum flow regime at SYB	Restrictions AA and BA permits
Monthly variable SYB minimum flow regime when the level of Lake Opuha is above 375m. ³	No restriction
Alternative monthly variable minimum flow regime when the level of Lake Opuha is below 375m but above 370m. ⁴	Community supply takes: 75% of the maximum allowable rate of abstraction. ⁵ All other takes: 50% of the maximum allowable rate of abstraction. ⁶
When the level of Lake Opuha is at or below 370m, the discharge from the Opuha Dam shall be reduced to the sum of the inflows to Lake Opuha from the North and South Opuha Rivers. ⁷	Community supply takes: 50% ⁸ All other takes: restricted as per AN permits ⁹ (i.e. based on flows at SH1).

- 4.10 One of the key shortcomings of the current ORRP regime is that water abstraction is permitted to continue without restriction until Lake Opuha drops to 375m, which equates to around 10% of Lake Opuha's storage. The

² Section 32 Report, Section 10.9.1, page 252.

³ ORRP, Section 5.3.6.2, Rule 2(1)(b).

⁴ ORRP, Section 5.3.6.2, Rule 2(1)(c).

ORRP, Rule 2(1)(d).

⁵ ORRP, Rule 2(1)(e).

⁵ ORRP, Rule 2(1)(h).

⁵ ORRP, Rule 2(1)(f).⁵ ORRP, Schedule B(1)(b)(ii) and (d)(ii).

⁶ ORRP, Schedule A(1)(b)(iii) and (d)(iii).

⁷ CRC950577.5, Condition 4.

⁸ ORRP, Schedule B(1)(b)(iii) and (d)(iii).

⁹ ORRP, Schedule A(b)(i) and (d)(i).

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OEFRAG's learnings during the 2014 – 2016 water short event

- 4.15 As Mr Webb has explained in his evidence for the AMWG, the 2014/15 irrigation season began off the back of a winter and spring with very low inflows and snowfall in the catchment above the Opuha Dam. This situation, combined with an early start to the irrigation season due to a dry winter/spring, meant that there was very heavy demand on Lake Opuha's storage, with the Lake being at 91% full at the start of October but drawdown during the month bringing the Lake to 67% full by the end of October.
- 4.16 At OEFRAG's first meeting in early November 2014, it was clear that implementing the regime proposed by the Draft Plan Change was not going to sustain the Dam's storage through the irrigation season. At the time, OEFRAG members estimated that the Dam would be empty by 31st January.
- 4.17 An alternative approach was needed, and OEFRAG members set about identifying new goals for the season ahead. The agreed goals were:
- (a) To reduce the rate of outflow from the Lake to retain water in the Lake for as long as possible;
 - (b) To share the pain equitably between the different users; and
 - (c) The river must remain connected.
- 4.18 These goals informed OEFRAG's recommendations to ECan for WSDs between November 2014 and April 2016, which included the series of reductions in the minimum flows at SYB prescribed by the ORRP and increases in restrictions for all abstraction described in Mr Webb's evidence. Through OEFRAG's careful and informed management of Lake Opuha's storage, the WSDs were successful in sustaining the Lake's water level above empty and maintaining connectivity downstream in the mainstem of the Opihi River.
- 4.19 The key learnings from this event, which have informed OEFRAG's approach to WSD's since 2016, and the subsequent workstreams of the AMWG (which I discuss later in my evidence), include:
- (a) A flow of 2 cumecs at SYB maintains a connected river. The flow should never drop below this unless the Dam is empty.

- (b) That weather is very variable. Management of the Opuha Dam and downstream river system must be able to adapt to the situation as it develops.
- (c) All abstractors (including community supplies) must reduce allocation during dry periods to sustain the instream ecosystem and irrigation; restrictions must commence before Lake Opuha reaches 375m.
- (d) There are three key drivers that should influence decisions around water management in the Opihi catchment (including the timing of restrictions): snow pack, Lake inflows and Lake level.

4.20 The authors of the Section 32 Report note that the *water shortage directions, as well as the use of OEFRAG in this capacity, have received a mixed response from community in the OTOP sub-region.*¹⁰ It is unclear what information has informed that comment. On the contrary, it is my opinion that the OEFRAG “story” demonstrates the value of a collaborative stakeholder-led approach in the management of finite water resources during water short periods, which has been a necessity in the Opihi catchment while the community has awaited ECan’s review of the ORRP.

4.21 A similar view was shared by ECan’s former “regional manager implementation and extension” (now ECan’s Operations Manager - Timaru), Judith Earl-Goulet, who was reported in a Timaru Herald article dated 18 April 2015 as saying:

OEFRAG has worked well in a number of different ways...It has been the group’s vision to see a wider role than just that specified in the plan, and contributed to a potential for a resource management link to the Orari-Opihi-Pareora zone committee...OEFRAG has provided mature discussion and behaviour, with people actively seeking to understand other’s perspectives, listening and questioning to ensure better understanding, and the group’s decisions – almost always unanimous – are focused on the immediate impact as well as the medium – and longer-term impact. It is a model that I think, if applied to other schemes, would provide more community connection and lift their profile as major water users in the community...

¹⁰ Section 32 Report, Section 10.9.1, at page 252.
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- 4.22 Certainly, Recommendation 5.3.1(l)(h) of the ZIPA¹¹ and the decisions sought in numerous submissions on Part B of PC7 indicate community-wide support for OEFRAG and the importance of its role in managing water resources in the Opihi catchment.

5. ADAPTIVE MANAGEMENT WORKING GROUP

- 5.1 The opportunity to develop a new augmentation regime for the mainstem of the Opihi River arose during the early stages of the OTOP Zone Committee's Healthy Catchment Project.
- 5.2 The members of OEFRAG recognised the value of bringing together the learnings and research of the last 20 years of the Opuha Dam's operation, and in particular, during the water short period between November 2014 and April 2016, to inform the development of a new regime. CSIFGC, DOC, OWL and TDC subsequently formed the "Adaptive Management Working Group" in late 2016. The AMWG was endorsed by the OTOP Zone Committee as a technical group focused on developing the potential elements of an adaptive management regime for consideration by the Zone Committee for inclusion in the OTOP ZIPA, and the future OTOP sub-regional plan change (i.e. PC7).
- 5.3 As a key member of OEFRAG, Te Rūnanga o Arowhenua was also invited to be represented on the AMWG. Unfortunately, the AMWG understands that resourcing issues has precluded the Rūnanga from participating in the AMWG's discussions and workstreams since 2016.
- 5.4 I also note that DOC representatives participated in the AMWG up until the notification of PC7. DOC was not involved in drafting the AMWG's submission on PC7, but I understand that it does not oppose the matters raised in that submission or the changes to PC7 that it seeks.
- 5.5 The AMWG's primary aim was to develop a regime that can respond to various climatic and river health situations as they arise, and make the best use of storage capability of Lake Opuha for the purpose of:

¹¹ This recommendation is that:

The OTOP sub-region plan change includes an Adaptive Management Regime for the augmentation of the Opuha and Opihi rivers that provides for:

...

h. The Opuha Environmental Flow Release Advisory Group.

- (a) Retaining connectivity in the Opihi River and reliability of supply for the river, affiliated community water supply and affiliated irrigators; and
 - (b) Improving river health in the downstream catchment.
- 5.6 The AMWG submitted a draft proposal to the Zone Committee in September 2017, and its final proposal was submitted in October 2018. This followed an almost 2-year process involving numerous meetings, extensive data analysis and related technical workstreams (including development of a snow pack estimation model and Lake inflow and Lake storage thresholds) carried out by consultants engaged by OWL for the AMWG, including Dr Tim Kerr (Rainfall. NZ Ltd) and Dr Greg Ryder (Ryder Environmental).
- 5.7 Consultation with ECan planning and technical staff on various elements of the AMWG's proposal occurred periodically during the intervening period (and later, prior to First Schedule RMA consultation on the Draft PC7, as discussed further in Ms Crossman's evidence for the AMWG).
- 5.8 It was anticipated that the AMWG and ECan would have the opportunity to work together to fine tune the proposal prior to the finalisation of the ZIPA, but this was not possible due to ZIPA timeframes. This situation is reflected in the ZIPA, which provides a high-level recommendation for the OTOP sub-regional plan to include an "*adaptive management regime for augmentation of the Opuha and Opihi rivers*" that provides for various listed matters.¹²
- 5.9 Since notification of PC7 and the Section 32 Report, the AMWG has worked with its consultants to review and assess ECan's proposed augmentation regime for the mainstem of the Opihi River. Due to the lack of technical assessment supporting the regime proposed by PC7, it has been necessary for the AMWG's consultants to carry out extensive modelling and associated analysis so that the implications of PC7 and alternative options for managing the storage of Lake Opuha and maintaining minimum flows at SYB could be fully understood. This work also included a "scenario testing" workshop, which was held by the AMWG in December 2019, and was focused on sense checking assumptions used in the modelling of PC7's "alternative management" regimes

¹² ZIPA, Recommendation 5.3.1, page 47 t 48.
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and alternative flow regime options, informed by OEFRAG members' experience and knowledge.

- 5.10 This additional work, plus ecological advice provided by Dr Ryder, informed the AMWG's submission on PC7.

6. THE AMWG'S KEY CONCERNS WITH PC7 AND SECTION 42A REPORT RECOMMENDATIONS

- 6.1 As outlined in its submission on PC7, the AMWG fully supports the inclusion of a "full availability" and discretionary "alternative management" environmental flow regime for the augmentation of the mainstem of the Opuha and Opihi Rivers in PC7. In the AMWG's view, a discretionary tiered minimum flow framework is appropriate and necessary for a dynamic river system such as the Opihi.

- 6.2 However, the AMWG has the following three key concerns with the PC7 planning framework:

- (a) There are numerous fundamental errors and omissions, particularly in relation to the existing planning and operational framework for augmentation and water abstractions in the mainstem and tributaries of the Opuha and Opihi Rivers.
- (b) The underlying basis for the proposed SYB minimum flow regime is OEFRAG's Draft Plan Change, which was developed by OEFRAG as a "consultation draft" more than 10 years ago and does not take account of the learnings gained through the development and implementation of WSD since then. Only limited technical and ecological analyses appear to have been undertaken to inform the related PC7 provisions.
- (c) For the sake of simplicity, the proposed regime and associated planning framework:
 - (i) lacks the necessary level of detail and flexibility to effectively respond to changes in hydrological and non-hydrological conditions in the Lake Opuha catchment, which is likely to result in a continued reliance on WSDs; and

- (ii) is unlikely to achieve the outcomes envisaged by the objectives and policies of the CLWRP, including PC7.

- 6.3 The recommendations made in the Section 42A Report in relation to Tables 14(v), (w) and (x) and the associated policies fail to address these key shortcomings of PC7. This is particularly concerning as the evidence of the AMWG's expert witnesses, particularly Dr Kerr, indicates that if the PC7 SYB minimum flow regime was to be adopted (with or without the Section 42A Report recommendations incorporated), the regime would have severe consequences for Lake Opuha's storage, affecting the ability to maintain SYB minimum flows with consequential risks to connectivity in the mainstem of the Opihi River.
- 6.4 Based on that expert advice, the AMWG is seriously concerned that under PC7 as notified there would be a continuing reliance on WSDs. Such an outcome is not supported by the AMWG, and is entirely inconsistent with ECan advice pre-notification of PC7 as discussed in the evidence of Ms Crossman.
- 6.5 In the following paragraphs, I outline the amendments that the AMWG considers are required to PC7 to address the concerns raised in its submission in light of the Section 42A Report. The specific changes to PC7 that the AMWG seeks are addressed in Mr Ensor's planning evidence.

Policies

Policies 14.3.35, 37, 38 and 39

- 6.6 The Section 42A Report recommends wholesale deletion of key policies or aspects of policies that provide detail and direction about SYB minimum flow compliance and how the proposed alternative management regime is intended to apply.
- 6.7 In his planning evidence, Mr Ensor has expressed reservations about deleting so much detail from PC7's policies and its implications for plan implementation. The AMWG accepts Mr Ensor's advice in this regard and considers that:
- (a) If Policies 14.4.35(b) and 14.4.39 are to be deleted, the SYB minimum flow compliance period, flow variance and flow transition period should be recorded in footnotes in Table 14(v).

- (b) Policies 14.4.37 and 38 should be retained, subject to modifications as requested in the AMWG's submissions and addressed by Mr Ensor.

Policy 14.4.35(d): lake outflows

- 6.8 Policy 14.4.35(d) requires as follows:

When the level of Lake Opuha falls below RL370, water released from the Opuha Dam for augmentation of the Opuha and Opihi mainstems equal inflows into the Lake.

- 6.9 The AMWG's view is that the outflows should only equal the inflows until the flow at SYB equal the required augmented flow and the balance should be retained to refill the Lake, which is the current requirement of OWL's consents for the Opuha Dam. The AMWG's submission sought amendments to provide the necessary qualification in this Policy, which is addressed in Mr Ensor's evidence.

Policy 14.4.35(e): artificial freshes

- 6.10 The Section 42A Report records a preference for the artificial fresh policy, Policy 14.4.35(e), to be outcome focused rather than prescriptive. Ironically, as Ms Crossman has noted, this was the approach originally proposed by the AMWG but was not favoured by ECan's planners, who instead insisted on prescription around magnitude and duration of artificial freshes being included in PC7.
- 6.11 The AMWG agrees in principle with the concept of an outcome-based artificial fresh policy. However, it has serious concerns about the recommended rewording of Policy 14.4.35(e), which if adopted would require artificial freshes or flushing flows to be released from the Opuha Dam that:

...are effective at periphyton removal so that it does not reach nuisance levels, 'refreshing' the river and opening the river mouth to enable fish passage.

- 6.12 Mr Mockford, Mr Measures and Dr Kerr address in their evidence the infrastructure constraints, the size and duration of flushing flows that would be required to achieve these outcomes and implications for Lake Opuha storage. On the basis of that evidence, and that of Mr Webb and Dr Ryder in relation to freshwater quality and ecological considerations, the AMWG considers that

refinements to the recommended rewording of Policy 14.3.35(e) are required to provide an achievable outcome-based policy. Mr Ensor has explained the changes requested in his evidence, including modification of PC7's proposal for recouping the volume released for an artificial fresh.

- 6.13 If a prescriptive artificial policy is preferred, the AMWG's position remains as set out in its submission, as further addressed in the evidence of Mr Measures and Mr Ensor.
- 6.14 It is also the AMWG's view that the provision made in PC7 for compensating flows following artificial freshes should be retained in Policy 14.3.35(e), given the implications of the alternative recommended by the Section 42A Report (i.e. no compensatory flows) for storage and SYB flows. In light of the results of Dr Kerr's modelling, I consider it is very likely that if compensatory flows are not provided for, artificial freshes would be released less frequently in order to preserve Lake storage for water short periods. Mr Ensor has outlined the changes to PC7 sought by the AMWG in this regard.

SYB flow regime framework

- 6.15 The Section 42A Report recommends that PC7's proposed 'three tier' minimum flow regime for SYB (comprising "full availability", Level 1 and Level 2) be replaced with a 'two tier' minimum flow regime (comprising Level 1 and Level 2). The AMWG understands that if adopted, this recommendation would have the effect of imposing a mandatory requirement on the operator of the Opuha Dam to reduce PC7's "full availability" minimum flows to PC7's Level 1 minimum flows when any two of the Table 14(x) thresholds are crossed. Two key elements of the PC7 regime as notified would be deleted: the discretion to reduce "full availability" minimum flows and the Level 2 alternative management regime.
- 6.16 The AMWG is confused by the recommendation as there appears to be no underlying technical analysis to support it, and it is not aligned with the recommendation made in the technical memo comprising Appendix D.6 of the Report, which supports the retention of PC7's discretionary 'three tier' framework, subject to the provision of monthly variable Lake level thresholds (in Table 14(x)).

- 6.17 The recommendations appear to have been made in a vacuum, without consideration of the wider context within which the PC7 regime was developed, an understanding of the framework proposed by PC7 and the effects for the wider Opihi catchment of removing the key element of adaptability that framework was intended to include. Dr Kerr's modelling indicates that the recommended deletion of the third tier and discretion to reduce minimum flows would impact on the ability for OWL to preserve Lake storage, and consequently maintain the stated minimum flows. Mr Ensor addresses the related statutory planning implications of the recommendations in his evidence.
- 6.18 The AMWG has gathered from comments made variously across the Section 42A Report that the underlying concern may relate to uncertainty created by the discretion built into the PC7 regime (as notified) in terms of when and if the full availability minimum flows are reduced to Level 1 or Level 2 minimum flows.
- 6.19 Mr Ensor has considered this issue from a planning perspective and has outlined possible solutions in his evidence based on examples of the approaches adopted in existing regional consents. In summary, Mr Ensor's preference is for a management plan approach through the resource consenting process, which would allow stakeholder involvement in decision-making and ECan certification for decisions.
- 6.20 The AMWG considers that this approach would provide the flexibility sought in its submission, certainty, and subject to other elements of the AMWG's submission being addressed, would still enable the management of storage in Lake Opuha to occur in a way that responds to changing climatic situations in the Opuha/Opihi catchment.

SYB minimum flows

- 6.21 In response to submissions, no changes are recommended to PC7's "full availability" and "Level 1" minimum flows in Tables 14(v) or (w) in the Section 42A Report. However, deletion of PC7's proposed "Level 2" regime and the reference in Table 14(v) to "current from 1 January 2025" is recommended.
- 6.22 Based on the ecological and hydrological evidence of Mr Webb, Dr Ryder and Dr Kerr, the AMWG does not agree with the Section 42A Report

recommendations and maintains the position as expressed in its submission that:

- (a) Amendments to the “full availability”, Level 1 and Level 2 minimum flow regimes in Table 14(v) as notified are required to better reflect instream ecological needs and provide consistency with PC7’s minimum flow requirements at State Highway 1 (Table 14(u)); and
- (b) Table 14(w) should be deleted due to the fundamental flaws in the underlying rationale for the proposed 2030 minimum flows (or in the alternative, the additional policy sought in the AMWG’s submission be included in PC7 to address the concerns raised by the AMWG).

6.23 I address the AMWG’s position on each of these elements of the PC7 regime in the following paragraphs.

2025 “full availability” minimum flows

6.24 As I have already explained in my evidence, PC7 as notified retains the ‘full availability’ minimum flows that are specified in the ORRP. The changes to those minimum flows sought in the AMWG’s submission maintain the general pattern of seasonal variability consistent with the Proposed PC7/ORRP flows through slight changes in the distribution of minimum flows between months, as follows:

- (a) Higher average monthly minimum flows in January and February; and
- (b) Lower average monthly flows in March, April and October.

6.25 As Mr Webb has explained in his evidence for the AMWG, the higher flows in January and February sought by the AMWG were driven by public perception (typically the months where complaints are made about low flows in the river), and the desire to improve the river mouth health and reduce the incidence of cyanobacteria blooms in the lower reaches as much as possible during peak summer months. Mr Webb further confirms that Fish and Game were comfortable with the higher flows being carved off the shoulder seasons and redistributed to the summer months as the current high flows during these shoulders are to facilitate conditions for fish passage and angling.

- 6.26 The AMWG's position, informed by the advice of Mr Webb and Dr Ryder (as set out in their evidence), is that the changes to the "full availability" flows that it seeks provide sufficient flows for salmon migration (March and April) and whitebait migration (October) as the flows at SYB would be of sufficient magnitude to maintain an open river.

2025 "Level 1" and "Level 2" minimum flows

- 6.27 As noted earlier in my evidence, the PC7 "Level 1" and "Level 2" minimum flows have been drawn directly from OEFRAG's Draft Plan Change, which was prepared as a consultation draft more than 10 years ago. Unlike the changes sought in the AMWG's submission, the AMWG is unaware of any hydrological, ecological or other technical assessments being carried out by ECan to inform or verify the appropriateness of those minimum flows and whether they will achieve the outcomes identified in proposed Policy 14.4.35.
- 6.28 I have also explained earlier in my evidence that OEFRAG's Draft Plan Change formed the basis of OEFRAG's recommendations on WSDs after 2008, and in particular during the dry years of 2014-2016. While I acknowledge that the application of the Draft Plan Change produced a result that was better than the default regime in the ORRP, the OEFRAG experience during these water short years was that it was ineffective in achieving the quantum of and timeliness of water savings required to prevent Lake Opuha from emptying, and consequently the ability to maintain minimum flows.
- 6.29 Based on OEFRAG's experience during 2014-16, the AMWG is seriously concerned that:
- (a) The reductions in minimum flows through the proposed PC7 Level 1 and Level 2 Regimes will not be enough to make meaningful water savings so as to ensure reduced minimum flows are maintained through any water short period.
 - (b) The proposed PC7 regime does not adequately provide for a situation where the Lake may be empty at the end of the irrigation season and inflows continue to be low throughout the following autumn/winter/spring. Without the ability to make water savings over the period April-August, the likelihood of a full lake at the start of the

following season, and consequently the ability to maintain minimum flows, is compromised.

- 6.30 In addition, and while related to the thresholds in Table 14(x) discussed later in my evidence, the AMWG is also concerned that PC7's proposed lake level threshold for moving into a Level 1 Regime (RL385) equates to 51.88% full. The AMWG consider this is too low to make any meaningful impact in terms of preserving Lake storage and consequently the ability to maintain minimum flows.
- 6.31 The AMWG's concerns in this regard are confirmed by the modelling undertaken by Dr Kerr and addressed further in his evidence. Dr Kerr's evidence also confirms that the deletion of the Level 2 regime, as recommended in the Section 42A Report, is likely to result in a drained lake in water short periods, again compromising the ability to maintain minimum flows at SYB.
- 6.32 The AMWG has sought changes to the 2025 Level 1 minimum flows. As with the AMWG's proposed changes to the 2025 "full availability" flows, these flows provide more water to the environment in the critical summer months of January and February compared with PC7, and have the advantage of also providing greater water savings (to preserve Lake storage) across the year. The evidence of Mr Webb and Dr Ryder support the AMWG's changes from ecological and recreational perspectives.
- 6.33 The basis for the changes sought in the AMWG's submission to the Level 2 minimum flows are set out in Mr Webb's evidence. In summary, the AMWG is seeking that the Level 2 minimum flow regime align with PC7's proposed Opihi mainstem environmental flow requirements at State Highway 1 for AN permits (Table 14(u)) of 2.6 cumecs, which equates to 3.5 cumecs at SYB.

2030 "full availability" minimum flows

- 6.34 The AMWG opposes the increases in the "full availability" environmental flows beyond those proposed in Table 14(v), which would take effect from 2030 (Table 14(w)) and apply only to AA and BA permits. As Mr Webb explains in his evidence, the mathematic and hydrological rationale for the proposed 2030 increases is fundamentally flawed. Dr Ryder comments on the Table 14(w) flows in terms of ecological considerations.

- 6.35 Mr Mockford notes that the proposed minimum flow increases would result in approximately 5.2 million cubic metres (on average per year) of additional water released from Opuha Dam to meet the proposed increase in minimum flows, which would reduce the availability of stored water volume in Lake Opuha for environmental and irrigation releases by approximately 8% per year on average. The AMWG is seriously concerned about the potential implications of this lost storage for meeting the environmental, community supply and irrigation needs in the catchment and consequently frequency of water shortages into the future. The AMWG also questions why the proposed increase in mainstem flows applies to PC7's minimum flow regime at SYB for AA and BA permits only; no commensurate increases are proposed for the Table 14(u) minimum flow regime at SH1.
- 6.36 The AMWG remains of the view expressed in its submission that Table 14(w) should be deleted.

Alternative management thresholds

- 6.37 Dr Kerr's evidence addresses the outcome of his modelling in terms of the benefits and disbenefits of PC7's alternative management regime and the changes sought in the AMWG's submission. Based on Dr Kerr's evidence, the AMWG remains concerned that PC7's overly simplistic approach to the alternative management thresholds would preclude proactive management of Lake Opuha storage as climatic and river health conditions change, and will not achieve the outcomes identified in proposed Policy 14.4.35.
- 6.38 One of the AMWG's fundamental concerns is that PC7 (and the recommendations in the Section 42A Report) allows threshold assessment to occur at the start of each calendar month only.
- 6.39 As Mr Mockford notes, this approach fails to recognise that climatic conditions and water demand can change significantly over a month. The AMWG is concerned about the implications of delayed intervention on Lake storage and the ability to maintain minimum flows during water short periods.
- 6.40 The frequency of entry/exiting reduced minimum flow regimes is alluded to in the Section 42A Report. There the authors state:¹³

¹³ Section 42A Report, Part 4 at 9.62, page 317.
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In our opinion, the period of reduced minimum flow should be minimised and a return to the 'normal' minimum flow occur as [soon as] possible...

- 6.41 Unfortunately, this concern does not appear to be reflected in the authors recommended changes to PC7.
- 6.42 The AMWG therefore maintains the position as expressed in its submission that:
- (a) PC7's alternative management thresholds should be able to be assessed daily rather than monthly as proposed by PC7;
 - (b) PC7's alternative management regimes should continue to apply for a minimum duration of two weeks, or less,¹⁴ rather than an entire calendar month as proposed by PC7; and
 - (c) PC7 should make provision for an 'exit strategy' for Level 1 and Level 2 regimes based on Lake Opuha levels, rather than the default position under PC7 (i.e. the threshold assessment at the start of the next month).
- 6.43 In relation to the Lake level thresholds, I note that the technical memo forming Appendix D.6 of the Section 42A Report accepts the AMWG's request for monthly variable lake level thresholds in Table 14(x). Dr Kerr has, however, expressed concerns about the threshold values recommended and has addressed this further in his evidence. Based on Dr Kerr's advice, the AMWG considers that the Lake level thresholds sought in its submission should be preferred.

Partial restrictions

- 6.44 The AMWG's position on partial restrictions and response to the compliance issues raised in the Section 42A Report is addressed in the evidence of Ms Crossman. Based on that evidence, the AMWG continues to seek the adaptive partial restriction regime that it sought in its submission on PC7.

¹⁴ Similar to the approach taken in section 329(3) RMA, which requires that WSDs may not last for more than 14 days, but may be amended, revoked, or renewed by the regional council by subsequent direction.

Rules 14.5.29 and 14.5.30: Augmentation

- 6.45 The AMWG's submission sought the inclusion of a further condition in the augmentation rule, Rule 14.5.29, for the provision of an operational management plan. The intent of this change was to provide community confidence that OWL would manage Lake Opuha within the bounds of the PC7 framework in consultation with key stakeholders such as the Papatipu Rūnanga, DOC, CSIFGC and community water suppliers (Timaru and Mackenzie District Councils), in a similar way to how OEFrag has operated historically.
- 6.46 The AMWG acknowledges that it is not essential that Rule 14.5.29 be conditional on the preparation of the intended operational management plan, this being a matter that could be addressed through a future consenting process in any event. Notwithstanding that, it remains of the view that the additional condition sought would be a positive addition to Rule 14.5.29 and that the operational management plan is an appropriate place to address the stakeholder consultation approach envisaged by the AMWG for future decisions during water short periods, and in relation to flow transitioning, flood buffering and artificial freshes.

Other matters

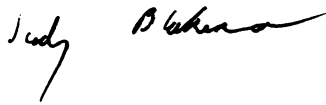
- 6.47 The AMWG's submission sought various minor wording changes to PC7 provisions to reflect current aspects of the ORRP regime or Opuha Dam consenting framework. These, together with any consequential or alternative amendments required to address the AMWG's submissions, are addressed in Mr Ensor's evidence.

7. CONCLUSION

- 7.1 The AMWG has viewed the PC7 planning process as an opportunity to imbed an appropriate flow management regime in the CLWRP, which recognises the learnings of OEFrag members over the last 20 years of the Opuha Dam's operation and enables the proactive management of Lake storage to achieve the range of outcomes envisaged by PC7.
- 7.2 The AMWG is concerned that PC7 as notified and the recommendations of the reporting officers miss the mark in various respects, which if confirmed, would

have potentially serious implications for the Opihi river system and those relying on surface water for abstractive use, including community water supplies. Ongoing reliance on WSDs via section 329 RMA is, in the AMWG's view, a likely outcome if appropriate amendments are not made to PC7.

- 7.3 The amendments sought by the AMWG are summarised in my evidence, set out more fully in Mr Ensor's planning evidence and the underlying rationale is addressed in the evidence of the AMWG's other witnesses. The AMWG considers those amendments are appropriate and necessary to achieve the outcomes sought by PC7 and ensure the sustainable management of the surface water resources of Lake Opuha.



Judy Cassandra Blakemore

17 July 2020