

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of resource consent applications by the
Ashburton Community Water Trust

**SUPPLEMENTARY STATEMENT OF EVIDENCE OF JASON MICHAEL HOLLAND ON
BEHALF OF THE NORTH CANTERBURY FISH AND GAME COUNCIL**

1. INTRODUCTION

- 1.1 My full name is Jason Michael Holland. My qualifications and experience, and the basis on which I prepared this brief, are set out in my previous brief of evidence prepared for this hearing.
- 1.2 In my evidence I address to the extent practicable requests put to me by Commissioners Milne and O'Callaghan during presentation of my previous brief evidence. These included:
- a. Consider and respond to the statement of evidence of Tim Ellis for the New Zealand Salmon Angler's Association.
 - b. Clarify what is required in relation to a 'gradual reduction' of discharges in order to encourage fish to move downstream of their own accord.
 - c. Propose conditions where possible to address matters of concern to Fish and Game.
- 1.3 Please note that due to time constraints I have limited (c) to a review of proposed conditions relating to proposed fish screening and bypass channel conditions only. I wish to stress this should not be taken as an implicit agreement with other conditions. If a preliminary decision is issued I will endeavour to provide a more comprehensive set of conditions, with associated reasoning, in reply to that.

2. EVIDENCE OF NZSAA

- 2.1 In this section of my evidence I summarise the issues raised by Mr Ellis and whether I agree or disagree with his position, with reference to my previous statement of evidence.

Potential for WCO breach from joint take

- 2.2 Mr Ellis (paragraph 7) appears to be concerned at the potential for the joint take application to cause a breach of Clause 7 of the WCO, particularly Clause 7(4) which specifies the maximum reduction in river flow that can occur as a result of abstraction or diversion.

- 2.3 I consider this is a valid concern. In paragraph 14.15 of my previous evidence I considered robust metering/recording arrangements are required to ensure this does not occur.

Effects of diversions and works in the riverbed on access and natural character

- 2.4 Mr Ellis (paragraphs 8, 9 12 and 18(f)) expressed concern about the potential direct and cumulative (in combination with CPWT) effects of diversions, discharges and associated works on natural braided character, flow (including potential flatlining effects), and access within the riverbed to main channels.
- 2.5 I do not consider it is likely that these types of diversions will cause 'flatlining', as I consider this is an effect that can only occur via abstractions or diversions that take water out of the riverbed.
- 2.6 However I do consider that diversions of water within the riverbed may have a significant effect on natural character (see my paragraphs 8.3 – 8.4).
- 2.7 I also agree with Mr Ellis (his paragraph 12) that the artificial maintenance of a channel against the southern bank of the river is likely to preclude access across the riverbed to the main river channel (my paragraphs 9.1 – 9.6). In my statement of evidence to the CPWT hearing I also considered this effect in relation to similar activities (i.e., activities that would maintain flowing channels adjacent to the north bank) affecting the ability of recreational users to gain access to main channels.
- 2.8 I find it is difficult to recommend possible conditions to ensure these adverse effects are appropriately avoided or mitigated given (in my view) little or no information has been provided on these matters either by ACWT or CPWT (my paragraphs 2.2 and 16.11 of my previous evidence).

Fish screening

- 2.9 Mr Ellis (paragraphs 11 and 18(a) and (d)) expresses concern about proposed fish screening, including that debris may cause fish screens to fail, which would cause fish losses.
- 2.10 While I agree that any failure of the screen is a concern, I note that a condition has been volunteered by the applicant preventing the taking of water at any time that the

screen is not effective at excluding fish, which is a considerable incentive for the applicant to make sure that the screen is operational. I also note the applicant has provided for regular checking of the screen particularly when river flows are high. In combination with other aspects of the proposed fish screen conditions (inclusive of recommended changes), I am satisfied that the issues raised by Mr Ellis has been adequately addressed.

Effect of operational discharges on water quality

- 2.11 Mr Ellis (paragraph 12) considers that the operational discharge from Highbank (and while he omits reference to it, presumably also the operational discharge from the Barrhill Power Station) will be sediment laden, because the take can only occur at flows when sediment is high, and may be released at times when flows have receded (and are thus clearer).
- 2.12 I consider that the water quality from the operational discharges is a valid concern, and I have addressed the need for operational discharges to meet all Clause 9(2) standards in my paragraph 6.2.

Safety risks from emergency discharge

- 2.13 Mr Ellis (paragraph 13) considers risks to river users from emergency discharges from the storage pond area cannot be avoided or mitigated.
- 2.14 Given that such discharges are likely to be sudden, I agree that it is difficult to foresee how river users can be protected from these discharges. I note that the applicant has volunteered conditions requiring signage and an audible alarm, and in paragraph 7.2 of my previous evidence I pointed out a condition on an existing Barrhill Chertsey consent requiring a visual check of the area, with all practicable measures to be taken to warn anyone in person of an impending discharge. However these conditions assume that a discharge can be reasonably foreseen, rather than an unexpected breach from the storage area. Therefore I consider Mr Ellis's concerns may not be addressed even if my recommended addition is provided for.

Risk to upstream migrating adult salmon from operational discharges

- 2.15 .Mr Ellis (paragraph 15 and 18(c)) considers the discharge to the Highbank tailrace may cause 'popping' of the screen with subsequent entrainment and loss of salmon. While he does not mention the operational discharge from the Barrhill Power Station,

I assume he is similarly concerned at the risk of entrapment or migration delay from that discharge also. Similarly I would assume Mr Ellis is also concerned about this effect arising from the sluicing discharge.

- 2.16 I consider these to be valid concerns, and I addressed these matters in paragraphs 4.1 – 4.8 of my previous evidence. In summary I noted proposed conditions regarding protection of the effectiveness of existing barrier and bypass arrangements at the Highbank tailrace, and that Trustpower provided evidence as to the adequacy of those conditions. I also noted that proposed conditions regarding exclusion and bypass arrangements for the Barrhill Power Station discharge appeared promising but that they should be supplemented by monitoring and action plan conditions, a certification condition, and a condition requiring the gradual ramping down of discharges. In relation to the sluicing discharge I also noted the absence of any proposed conditions dealing with this potential effect.

3. CLARIFICATION OF THE PHRASE ‘GRADUAL REDUCTION’

- 3.1 In paragraph 5.6 I referred to the supplementary evidence of Mr Hay who suggested that a maximum permissible rate of change should be stipulated on larger discharges to avoid abrupt changes to flow rate, which would otherwise exacerbate the risk of fish stranding. As a starting point for construction of such a condition on operational discharges and the fish bypass discharge, I cited condition 5 of the Barrhill Chertsey sluicing discharge permit CRC990089 as follows:

The discharge of water and sediment via the sluice channel shall be gradually reduced to allow time for fish to find their way back to a flowing braid of the Rakaia River.

- 3.2 In response Commissioner O’Callaghan observed that the phrase “gradually reduced” is not particularly helpful, as it provides insufficient direction particularly regarding over what time period the reduction should occur.
- 3.3 I have subsequently sought further direction from Mr Hay. He has provided a paper on the topic of ramping rates which I have attached in full as Appendix 2. It appears from this paper that there are two main considerations that should be incorporated into any consent condition addressing this matter:
- a. The rate of change of water depth in the affected channel/s. A maximum rate of change of less than 10 cm/hr is shown to give useful protection to adult and

juvenile trout, whereas a rate of change of between 10-20 cm/hr may protect adult fish but gives less protection to juvenile trout.

- b. The time of day that the discharge is reduced. Generally it appears preferable to reduce discharges during darkness hours rather than during the day.

4. PROPOSED FISH SCREEN AND BYPASS CHANNEL ARRANGEMENTS

4.1 In relation to the fish screen, amended condition 2 of CRC021091 (take water) and condition 5 of CRC072636/073863 (divert/dam and convey water) largely provides for consistency with NIWA (2007). I have asked Mr Bejakovich to review these conditions. In addition to minor grammatical changes and the deletion of a remnant of condition 5 (presumably retained in error), he has recommended the following amendments as reflected in Appendix 1:

- a. The sweep velocity should exceed the approach velocity (amended condition states it shall NOT exceed...).
- b. The clause relating to 3mm wedgewire, 2mm slot mesh should be in relation to 'screening material opening size' rather than simply 'screens'. In relation to this recommendation, I understand Mr Dunning prefers the wording 'screen material void size'. I do not object to this alternative wording, and have adopted it (see Appendix 1).

4.2 It is my understanding that Fish and Game and the applicant are therefore in agreement regarding fish screen conditions.

4.3 In relation to the fish bypass, relevant conditions include new conditions 5-8 of CRC072638 (discharge from fish bypass), and the certification requirement under condition 2 of CRC021091 (take water) which includes a requirement for design plans for the bypass.

4.4 The only change I anticipate is required is to give effect to the previous discussion regarding the term 'gradual reduction' in Condition 8. I would observe this discussion is also pertinent to the equivalent condition on other discharges including operational and sluicing discharges.

J Holland

24 September 2008

APPENDIX 1: TRACK CHANGES TO PROPOSED FISH SCREEN CONDITIONS

CRC021091 – To take water from the Rakaia River

2. (a) The consent holder shall install, operate and maintain a fish screen in accordance with the NIWA publication *Fish Screening: Good Practice Guidelines for Canterbury, October 2007*, NIWA Client Report CHC2007-092 at the entrance to the Highbank canal at approximate map reference NZMS 260 K36:064-382. Water shall be diverted through the fish screen into the canal only when the fish screen is operated in accordance with the following provisions:
- (i) the fish screen shall cross the full width of the Highbank Canal to prevent fish bypassing the screen into the canal;
 - (ii) the screen ~~material void~~ size shall be no greater than 3 millimeter mesh or 2 millimeter wedgewire;
 - (iii) the screens shall have an approach velocity of no greater than 0.12metres per second;
 - (iv) the sweep velocity across the screens shall ~~exceed~~ the approach velocity;
 - (v) An effective bypass system shall be maintained at all times that water is diverted into the scheme, to connect to an active braid of the river;
- (b) each fish screen shall be inspected at a frequency no greater than 48 hours, or 24 hours when the Rakaia River flows exceed 300 cubic metres per second as estimated by Environment Canterbury at the Rakaia Gorge recorder site (at or about map reference NZMS 260 K:35: 015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437);
- (c) in the event that a screen is damaged so as to be rendered less effective at excluding fish from the canal, the consent holder shall repair or replace the screen immediately, or shall shut down the screen such that water ceases to pass through it. In the event that a screen is shut down, it shall not be reopened until such time as it complies in full with the provisions of condition (2) of this consent;
- (d) All incidence of screen shut down shall be recorded by the consent holder and reported to Fish and Game New Zealand within four hours. These records of screen failure shall be forwarded to the Canterbury Regional Council to the attention of the Compliance and Enforcement Manager, at the end of each irrigation season, or upon request.
- (e) The design plans for the fish screen shall be certified by a suitably qualified and experienced chartered engineer with experience in the design and operation of fish screens and / or a fisheries biologist with recognised experience in fisheries research to confirm that the design, function and operation of the screen is in accordance with the guidelines detailed in condition 2(a).
- (f) Prior to commencement of construction:
- (i) the consent holder shall provide to the Canterbury Regional Council:
 - (a) the certified design plans showing the screen slot size, sweep velocity, approach velocity, and a bypass which returns fish to an actively flowing braid of the Rakaia River;
 - (b) a report from the certifying engineer / fisheries biologist which certifies and explains how the certified design and operation of the screen demonstrates compliance with the guidelines detailed in condition 2(a).
 - (ii) the Canterbury Regional Council shall certify the design plans within 20 working days of receipt of those plans. The Certifier's report shall not be unreasonably withheld, and shall be forwarded to the consent holder and copied to the North Canterbury Fish and Game Council.

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CRC072636 – To divert surface water up to 42 cubic metres per second from the Rakaia River via an intake structure at approximate map reference NZMS 260 K36:057-393, into a settling pond, and to divert up to 40 cubic metres per second from the settling pond into the Highbank Canal, into the Highbank Power Station tailrace at approximate map reference NZMS 260 K36:083-360, into the Terrace Canal and into the Barrhill Power Station; and

CRC073863 - To dam and convey water in a settling pond at or about map reference NZMS 260 K36:057-391, in the Highbank Canal, in the Highbank Power Station tailrace at approximate map reference NZMS 260 K36:083-360, in the Terrace Canal and in a head pond at or about map reference NZMS 260 K36:152-280.

- 5) (a) The consent holder shall install, operate and maintain a fish screen in accordance with the NIWA publication *Fish Screening: Good Practice Guidelines for Canterbury, October 2007*, NIWA Client Report CHC2007-092 at the entrance to the Highbank canal at approximate map reference NZMS 260 K36:064-382. Water shall be diverted through the fish screen into the canal only when the fish screen is operated in accordance with the following provisions:

- (i) the fish screen shall cross the full width of the Highbank Canal to prevent fish bypassing the screen into the canal;
- (ii) the screen material ~~void~~ size shall be no greater than 3 millimeter mesh or 2 millimeter wedgewire;
- (iii) the screens shall have an approach velocity of no greater than 0.12metres per second;
- (iv) the sweep velocity across the screens shall ~~exceed~~ the approach velocity;
- (v) An effective bypass system shall be maintained at all times that water is diverted into the scheme, to connect to an active braid of the river;

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- (b) in the event that a screen is damage so as to be rendered less effective at excluding fish from the canal, the consent holder shall repair or replace the screen immediately, or shall shut down the screen such that water ceases to pass through it. In the event that a screen is shut down, it shall not be reopened until such time as it complies in full with the provisions of condition (5) of this consent;
- (c) All incidence of screen shut down shall be recorded by the consent holder and reported to Fish and Game New Zealand within four hours. These records of screen failure shall be forwarded to the Canterbury Regional Council to the attention of the Compliance and Enforcement Manager, at the end of each irrigation season, or upon request.
- (d) The design plans for the fish screen shall be certified by a suitably qualified and experienced chartered engineer with experience in the design and operation of fish screens and / or a fisheries biologist with recognised experience in fisheries research to confirm that the design, function and operation of the screen is in accordance with the guidelines detailed in condition 5(a).
- (e) Prior to commencement of construction:
 - (i) the consent holder shall provide to the Canterbury Regional Council:
 - (a) the certified design plans showing the screen slot size, sweep velocity, approach velocity, and a by-pass which returns fish to an actively flowing braid of the Rakaia River;
 - (b) a report from the certifying engineer / fisheries biologist which certifies and explains how the certified design and operation of the screen demonstrates compliance with the guidelines detailed in condition 5(a).
- (k) The Canterbury Regional Council shall certify the design plans within 20 working days of receipt of those plans. The Certifier's report shall not be unreasonably withheld, and shall be forwarded to the consent holder and copied to the North Canterbury Fish and Game Council.

APPENDIX 2 – PAPER ON RAMPING RATES