

**IN THE MATTER OF** the Resource Management Act 1991

**AND**

**IN THE MATTER OF** various applications by the Central Plains Water Trust to the Canterbury Regional Council.

### **SUPPLEMENTARY REPORT OF LEO FIETJE**

1. This report deals with a number of matters that have arisen during the course of the hearing and on which I would like to offer comment in addition to the material contained within my original section 42A report.
2. Where appropriate other 42A report writers have also and separately prepared supplementary reports which will be presented when they present their original reports.

### **NOTIFICATION**

3. Due to the scale of the notification, the initial s42A report did not provide details of those persons who were directly served notice of the applications.
4. After consultation between Environment Canterbury, Selwyn District Council and the applicant, it was decided that all parties within the scheme area and those within the dam breach area should be directly notified. Legal advice was provided by Mrs Faye Collins (a lawyer with Environment Canterbury) during the consultation period.
5. Notice was delivered to a total of 7404 properties on the 27 and 28 June 2006. A map of the area where direct notification was served is attached as Appendix A.
6. A complete list of all other parties directly notified (not within the above area) is attached as Appendix B.
7. Notification of the applications and the Notice of Requirement by the Selwyn District Council were included in the notification notice by Environment Canterbury.

### **OTHER CONSENTS IN PROCESS**

8. A number of consents that have some relationship to the applications before this panel are currently either in process, or under appeal. I have provided a brief overview of these consents, so the panel has a complete picture of these other consents.

### **Barrhill Chersey Irrigation Limited**

9. Barrhill Chertsey Irrigation Limited hold consent to take up to 17 cumecs from the Rakaia River, to irrigate land south of the River. They have recently applied to change this consent to irrigate over a larger area, between the Rakaia and Rangitata Rivers, using the Rangitata Diversion Race.
10. The application is currently awaiting the outcome of an application for declaration made to the Environment Court to see if there are any concerns with use of the Race and impacts on the existing consents held by the Rangitata Diversion Race Management Company.

### **Electricity Ashburton**

11. Electricity Ashburton, which operates the Montalto and Highbank Power Stations supplied by water from the Rangitata Diversion Race, was recently granted consent to use water allocated to Barrhill Chertsey Irrigation Limited to generate electricity through two power stations on the south side of the Rakaia River. The race supplying these power stations (and the stations themselves) will have sufficient capacity to take any additional water granted to the Ashburton Community Water Trust, if this panel decides to do so.

### **Synlait**

12. On the north side of the Rakaia River Synlait have been granted consent to take up to 6 cumecs of “band 2 and 3” water<sup>1</sup> to irrigate up to 6,000 hectares within the CPWT scheme area. The priority of this application and another made by Synlait were the subject of an application action for declaration to the Environment Court in which CPWT was successful. This was overturned on appeal to the High Court and CPWT has appealed that decision. It is now awaiting a hearing date before the Court of Appeal, on the issues related to priority.
13. The original decision of the Council was appealed by Dairy Holdings and the matter is adjourned in the Environment Court awaiting the outcome of the priority cases.
14. A further application by Synlait to take up to 6 cumecs of “band 5” water has been made and was notified on 12 September 2006 but has not been scheduled for hearing.

### **Ngai Tahu Properties Limited**

15. Ngai Tahu Property Limited have been granted consent to take up to 3.96 cumecs of water from the Waimakariri River, including the last of the “A” Permit water. That decision has also been appealed by CPWT on matters related to

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<sup>1</sup> Refer slide

priority. The matter is scheduled to be heard by the Supreme Court in mid-October. The Court of Appeal found in favour of CPWT.

## **WAIMAKARIRI RIVER REGIONAL PLAN**

**16.** The Waimakariri River Regional Plan is the operative plan for the Waimakariri River. A number of issues have risen regarding the intention and interpretation of the Plan, specifically regarding minimum flows, recording and measurement of flows, allocation of B permit water and the level of discretion allowed when considering the applications.

### **Minimum Flows**

**17.** The panel has heard that there is debate about the appropriate wording of conditions related to minimum flow, and whether the flow at the Old Highway Bridge should be referred to as “unmodified” or “measured”.

**18.** The Standards and Terms in Rule 5.1 refers to “A” Permits ceasing to take when the “unmodified flow” is at or below the “Minimum Flow” specified in Table 2. This Table refers to a “Minimum Flow” of 41 cumecs.

**19.** Confusion arises because the term “unmodified flow”, defined by the Plan, can be interpreted to exclude any taking of water so when the measured flow is 41 cumecs and 22 cumecs of A permit water is being taken, the “unmodified flow” is 63 cumecs.

**20.** Conversely when the “unmodified flow” is 41 cumecs and 22 cumecs of water is being taken, the measured flow will be 19 cumecs which is well below the clear intent of the Plan.

**21.** These difficulties are avoided when flow is measured upstream but the existing gorge site<sup>2</sup> is not suitable for measurement of flow, hence Environment Canterbury has recently installed a new telemetry site at Otarama.

**22.** A Plan Change is being prepared to incorporate this new site into the Plan, and clarify a number of other matters including the confusion related to “unmodified flow”. Most existing consents have now been reviewed to incorporate Plan requirements as conditions of consent. A notable exception to this is the consent held by Waimakariri Irrigation Limited which is destined for hearing.

**23.** The change of measuring site will enable better estimates to be made of the losses and gains between Otarama and the Old Highway Bridge, and the establishment of a relationship between flows measured at these two sites.

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<sup>2</sup> The Rakaia Rivers suffers from the same difficulties at the gorge, which is why the Fighting Hill site is used.

24. Having the flow measured at an upstream site also removes any concerns regarding the impact of CPWT on the reliability of existing users. However any abstraction of unused water already allocated would still require an arrangement for exchange of contemporaneous information to ensure the amount taken did not exceed the amount allocated.

### **Efficiency of Run of River v Stored Water**

25. Questions have been raised during this hearing about the relative efficiency of using run of river water versus stored water.

26. When the Plan was prepared calculations of reliability of A Permit water showed that during each of the months of September, October, November and December, the total 22 cumecs is available for over 90% of the time. During January, this declines to about 70%, and during each of the February, March and April months it declines to around 50% of the time.

27. The Plan envisioned that up to a further 8 cumecs of water may be sought as “B” Permit water but due to the much lower reliability it was considered unlikely that this water would be sought for “run of river” schemes.

28. Experience suggests that even the “A” Permit water is considered too unreliable for many land uses, particularly intensive grazing, given that Council has received a number of applications for the abstraction of groundwater to supplement supply from the Waimakariri Irrigation Limited scheme.

29. Given this experience, the distinction between “run of river” water supplemented with groundwater and water taken directly into surface storage and used when needed diminishes somewhat.

30. The advice repeatedly received by Environment Canterbury is that intensive grazing operations need very reliable water and it is not feasible to substitute this need with imported or stored feed. As such it is not at all clear whether a “run of river” system with relatively low reliability from January to April is inherently more efficient than a scheme relying on storage.

### **RELIABILITY OF SUPPLY AND REASONABLE NEED**

#### **Reliability of Supply**

31. Reliability of supply for CPWT shareholders is 90% with higher reliability available by separate arrangement.

32. The reliability of supply<sup>3</sup> indicated by the PNRRP<sup>4</sup> for surface water is 95% of the water needed in 6 years out of 10 and at least 75% of the water needed in 9 years out of 10.
33. I note this is considerably higher than both the reliability of the A Permit block for the Waimakariri River referred to earlier; and reliability of remaining allocation (upwards of Band 5) from the Rakaia River.
34. For groundwater<sup>5</sup> the supply reliability is full seasonal allocation in 8 years out of 10 and at least 60% of the water needed in 9 years out of 10. This level of reliability is considered to represent the optimal balance between reliability and maximising the number of users who can benefit from the use of groundwater.
35. Transfer of water is seen as one method of improving reliability but the Plan also envisaged that augmentation may be a practical option for improving water availability and reliability of supply in water bodies within the region<sup>6</sup>.

### **Reasonable Need**

36. Schedule WQN9 of Chapter 5 of the PNRRP sets out a range of annual volumes needed to supply either arable use or intensive pasture, with the same level of reliability as groundwater supply reliability<sup>7</sup>.
37. Intensive pasture generally needs more water than cropping because demand immediately following planting is relatively low, and similarly the crops often need to dry out before harvest. Over a season the difference between the two is typically around 100mm.
38. Schedule WQN9 also takes account of effective summer rainfall and soil depth. Deeper soils are better able to balance water supply and demand and carry forward winter rainfall hence crops and pasture grown in deeper soils need less irrigation.
39. Taking all three variables into account results in a range of ~ 300mm to 650mm over the irrigation season<sup>8</sup>. This range is lower than the 650mm average sought by CPWT to supply 90% reliability; however irrigation experts are still debating the appropriateness of these figures through the Plan hearings process with a significant uncertainty being the ability to achieve 80% irrigation efficiency<sup>9</sup>.

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<sup>3</sup> These apply to natural run of river and "normal" groundwater recharge conditions

<sup>4</sup> Policy WQN14(4)

<sup>5</sup> Policy WQN14(7)

<sup>6</sup> PNRRP Chapter 5 pg 5-120 Explanation and Reasons to Policy WQN21.

<sup>7</sup> Full seasonal allocation in 8 years out of 10 and at least 60% of the water needed in 9 years out of 10

<sup>8</sup> Demand of 550mm to 815mm and effective summer rainfall from 180mm to 270mm.

<sup>9</sup> Measured as water applied v water retained within the root zone.

40. A second aspect of reasonable need is the likelihood that irrigators within the scheme area will utilise the full volume sought, with the consequence of “locking up” the resource and denying its use to others.
41. The Rakaia River has an allocation cap of 70 cumecs and the application by CPWT is for all the remaining water. The Waimakariri River does not have a cap but the reliability of flows “behind” CPWT will be very low.
42. Given the uncertainties that exist it is difficult for anyone to predict the degree of take-up within the scheme, with cost being an obvious factor.
43. The potential for lock-up could be mitigated with appropriate conditions allowing others to take water not used by CPWT in much the same way as CPWT seeks to take water not used by other abstractors. However unlike the position of CPWT there would be no long-term security of access.
44. Other irrigators are currently using Rakaia River water allocated to Barrhill Chertsey Irrigation Limited, with a condition requiring they move to a different band once the Company exercises its consents.

#### **RAKAIA RIVER CONSERVATION ORDER**

45. The Rakaia River is subject to a Conservation Order which establishes minimum standards for water quality and quantity, as specified in my initial s42A report.
46. Since the commencement of the hearing, questions have been raised regarding the Rakaia River “banding” system and the rationale for including or excluding takes from the allocation of water from the River.

#### **Rakaia River Banding System**

47. The banding system has its origin in a requirement of the Order that water above the monthly minima must be shared 1:1 with the River.
48. In theory this means every new user should cease taking water at the rate at which the previous (higher priority) user begins to scale back their rate of take<sup>10</sup>.
49. In practice this is impractical for both irrigator and administrator; hence users have agreed to be “lumped” together in a number of bands, with each band managed as a single abstractor<sup>11</sup>. The number of bands was rationalised and reduced to three following hearings around 2001 when many of the existing consents expired. Since then Barrhill-Chertsey Irrigation Limited<sup>12</sup> fills another band (4) and applications received since then, including Synlait, occupy band 5.

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<sup>10</sup> Refer slide

<sup>11</sup> Refer slide

<sup>12</sup> Some relatively minor takes have also been allowed to join this band.

50. While not directly relevant for this hearing given it does not affect total allocation, there is some “untidiness” within the band system which Council proposes to address via a Plan change. This includes for example users being allocated to a band on the basis of priority, but consent conditions not reflecting the band boundaries.

### **Calculation of Rakaia River Allocation**

51. Several submitters have expressed concern at estimates of existing allocation of Rakaia River water and the applicant has itself been subjected to some uncertainty about available water during the preparation for this hearing.

52. Some of the uncertainty originates from the long history of use of Rakaia River water which predates the recording systems used today; and inconsistencies in the way diversions and takes were historically treated<sup>13</sup>. I am confident that following thorough review by a number of parties these sources of uncertainty are now behind us.

53. Remaining sources of uncertainty come from the treatment of riparian groundwater takes and the inclusion of diversions. Both require a level of judgment by the panel.

54. The Conservation Order is silent on the matter of riparian groundwater takes, yet some of these<sup>14</sup> can remove substantial quantities of additional<sup>15</sup> water from the River. Some of these takes are located on an island located within the bed of the River.

55. Various suggestions have been made about which groundwater takes to include, including the suggestion that this should be based on whether or not the consent includes conditions related to minimum River flows. I cannot recommend this approach for a variety of reasons, including the different approaches taken by various hearing panels and results of appeals which means there is no consistent approach to minimum flow conditions on existing consents.

56. My recommendation to this panel is that only those groundwater takes which remove substantial additional water relatively quickly be included in the allocation. This recognises and acknowledges that while River flows can change within a matter of days and hours, groundwater takes are buffered and typically take days or weeks to have an effect on river flows, by which time any benefit from cessation of pumping may have been cancelled by further freshes.

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<sup>13</sup> For example some irrigation takes were treated as takes from the River at source; others were included in the take for the water race.

<sup>14</sup> For example a gallery in the bed of the River.

<sup>15</sup> Above that which leaks naturally.

57. This approach is consistent with Policy WQN8 of the PNRRP which draws lines in the sand for both “substantial” and “relatively quickly”. Numbers supplied to and used by CPWT are based on this approach.
58. With respect to diversions, this again requires the exercise of judgment given that some diversions exist over a relatively short distance and only during the irrigation season to ensure there is sufficient flow past the point of take. Other diversions such as that proposed by ACWT are year-round and remove water from the bed for significant distances.
59. The Order refers to reductions in flow resulting from both takes and diversions. This has caused complications where for example water has been diverted into water races and subsequently taken for irrigation. The term “take” is commonly used to denote permanent removal while divert had been used where water is returned, but this distinction is not always clear.
60. The Order also refers to taking and diverting “not reducing flows ...” which is different to the approach taken in the PNRRP and Waimakariri River Regional Plan, both of which refer to the maximum amount of water that may be taken. This suggests water may be taken or diverted
61. A consequence of this interpretation is that water returned after diversion can be taken or diverted again, provided the flow at any point along the River is not reduced by more than 70 cumecs. This has significant implications for the calculation of allocation given that the ACWT diversion is returned to the River above the point at which existing irrigators further down the River take their water.

## **EXISTING IRRIGATION**

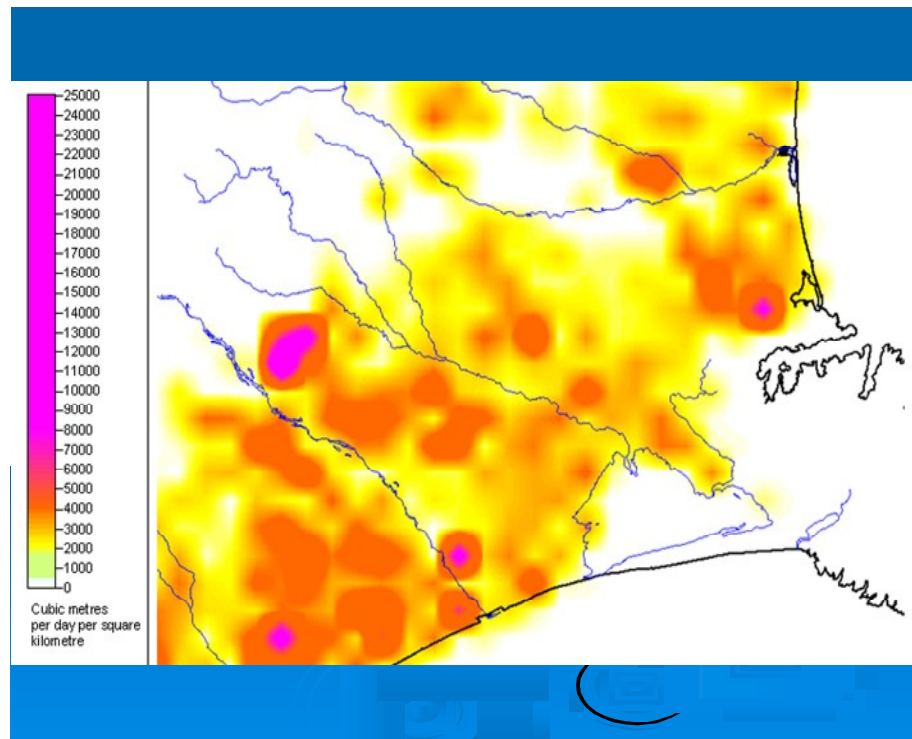
62. In his supplementary evidence Mr Mabin has set out areas of land currently irrigated and areas which may be irrigated if the scheme proceeds. I largely agree with his figures.
63. Estimating the area currently irrigated from groundwater is an imprecise science. This is partly because the area that can be irrigated from a fixed rate of take varies throughout the growing season; secondly because the areas specified on consents are often total farm areas within which only a portion will be irrigated. With Council’s proposal to manage groundwater on a volumetric basis and the volume based on land area, there is and will continue to be debate about the relationship between land area and annual volume allocated to a particular consent.
64. A further complication arises when taking account of the area that is authorized to be irrigated rather than area currently irrigated. Council has only just begun to see what happens when groundwater applications are declined and groundwater is seen as a finite commodity with a market value, able to be transferred within

the same catchment. The first stage of that process will be debate about what existing consents actually authorize in terms of annual volume and land area, neither of which was considered significant when water was managed on the basis of average daily rate of take.

65. Mr Mabin suggested around 33K<sup>16</sup> hectares is currently irrigated from groundwater, excluding consents recently granted in the Rakaia-Selwyn groundwater zone.

66. Using the formula<sup>17</sup> set out in Variation 2 to the PNRRP, the figure could be as high as high as 40K hectares. While this figure is designed to be conservative by taking only very limited account of system capacity, in reality every groundwater zone has seen an upwards creep in estimate of allocation and until such time as all permits have an annual volume, a more precise estimate is not possible.

67. Figures 1 shows the location and intensity of existing groundwater allocation.



**Figure 1. Location and intensity of groundwater abstraction.**

68. Mr Mabin also reports 3.5K hectares irrigated from surface water, thus the total area currently authorised to be irrigated from both ground and surface water could be as high as 43K hectares.

<sup>16</sup> Given the uncertainties in these estimates, figures are rounded.

<sup>17</sup> Schedule WQN4

69. The consent granted to Synlait (subject to appeal) authorises a further 6K hectares of irrigation within the CPWT scheme area hence and if Synlait is successful in obtaining its consent the figure could increase to as high as 49K hectares.
70. With an irrigable area of 76.5K<sup>18</sup> hectares within the scheme area, the area not consented to be irrigated could be as little as 33.5K hectares which decreases to 27.5K hectares if the appeals are settled in favour of Synlait.

## **TRANSFER AND SURRENDER OF WATER PERMITS**

71. The Act allows water permits to be transferred to other locations within catchments or aquifers and Council is starting to receive larger numbers of such applications.
72. The procedure for dealing with these is similar to applications for consent with the important exception that cumulative effects will generally not be an issue. However near-field effects are considered in the same way as a new application.
73. If existing holders of groundwater permits within the scheme area choose to receive scheme water then whether they retain or transfer such consents is likely to depend on factors such as market value and cost of obtaining more reliable water to top up “normal” scheme water.
74. Market value will in turn depend on the ease with which potential buyers can obtain permits for essentially the cost of investigation and processing. While Council staff consider groundwater within the scheme area to be fully allocated, that advice has not been accepted in every zone and groundwater permits continue to be granted which has a direct effect on the market value of existing permits.
75. If the scheme proceeds and significant groundwater recharge occurs then Council will have less reason to decline applications for further groundwater take, which again has a direct effect on market value of existing permits.
76. The applicants have not offered to surrender existing water permits held by scheme members and questions have been raised as to whether this should be a requirement if the scheme proceeds.
77. Given that members of the Waimakariri Irrigation Limited scheme have applied for groundwater permits to supplement scheme water and Council has granted these, there is no justification for taking a different approach for this scheme.
78. However the retention of such permits does create administrative difficulties related to how such consents are treated with respect to groundwater allocation.

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<sup>18</sup> Mabil Table 2.

This is a critical factor when determining the status of a groundwater zone and hence whether further groundwater can be allocated.

- 79.** Applicants in other groundwater allocation zones have challenged Council estimates of available allocation on the basis that some groundwater permits within the zone are only used to supplement surface takes; hence Council has over-estimated existing allocation.
- 80.** There is validity to this criticism, yet in law the permits authorise considerably higher volumes than are actually taken and such volumes are able to be transferred, or the permit fully exercised if holders decide not to continue taking scheme water.
- 81.** There is no simple answer to this, but requiring the surrender of all or most of the permit is one solution, albeit one that is probably unpalatable for scheme users holding existing permits.

#### **ON-FARM STORAGE PONDS**

- 82.** Over the last few years Environment Canterbury has seen a sharp increase in the number of applications for consents to dam water in on-farm storage ponds. Most of these occur when border dyke systems are converted to spray irrigation systems and relate to the need for greater (continuous) access to water.
- 83.** The PNRRP authorises the damming of small volumes of water as a permitted activity both within and outside the bed of a river (Rule WQN37 and WQN39). Larger volumes or damming within beds of rivers having high values are either prohibited, non-complying or prohibited by rules WQN41-43 respectively.
- 84.** Within the scheme area some five consents to dam have been issued since 2002, three<sup>19</sup> of these in the last twelve months<sup>20</sup>.

#### **STRATEGIC WATER STUDY**

- 85.** Several witnesses have referred to the Canterbury Strategic Water Study (CSWS) and how the CPWT proposal fits with that Study.

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<sup>19</sup> The other two are CRC021288, R & R Johnson, Springfield, 2002 (in-stream pond); and CRC051805: Glenroy Community Irrigation Company Ltd, Te Pirita, August 2005, 5 000m<sup>3</sup>

<sup>20</sup> CRC012692: Guild, Windwhistle, Dec 2007 increased size of pond to 83 000m<sup>3</sup>; CRC081339: Te Pirita Estates Ltd Te Pirita, Jan 2008, 160 000m<sup>3</sup>; CRC080183: Wai-kimihia Farm Ltd, Dunsandel, May 2008, 87 000m<sup>3</sup>

- 86.** The CSWS is both a series of technical studies, and a set of processes that have evolved over a considerable period of time. It has been carried out in stages, with Stage I providing a regional overview of water resources.
- 87.** Stages II & III of the study have focussed on potential water storages throughout the region – their hydrological feasibility and their likely public acceptability.
- 88.** The current stage includes a number of technical investigations around issues such as the impact of large-scale irrigation on groundwater quality and biodiversity values, but is primarily concerned with promoting a wide-ranging public debate on water management for Canterbury as a prerequisite to making sustainable long-term decisions about water storage or water management generally.
- 89.** Given this debate is occurring at that level the present proposal is arguably not directly relevant to the CSWS but any scheme that goes ahead before the strategy is finalised potentially forecloses on options or possibilities that may be preferred by the strategy – for example a storage scheme in the Malvern Hills servicing the central plains area could negate either another potentially more effective or efficient scheme in the same area, or a larger-scale proposal located elsewhere that relied on reticulation to (and through) the central plains for its ultimate viability

## **AUDITED SELF-MANAGEMENT AND FARM PLANS**

- 90.** The concept of audited self-management as distinct from self-regulation<sup>21</sup> and co-regulation<sup>22</sup> involves acceptance of responsibility for environmental outcomes, agreement on those outcomes, flexibility in achievement of outcomes, third party involvement in auditing and public reporting of performance.
- 91.** The concept of audited self-management is supported by Environment Canterbury senior management and following a recent request from Dr Terry Heiler the matter will be taken up with Council to seek endorsement at that level.
- 92.** While the concept of audited self-management has been used successfully elsewhere<sup>23</sup> Environment Canterbury's experience is largely confined to experience with the Opuha Dam scheme where Dr Heiler is also involved.
- 93.** Environment Canterbury has responsibilities to ensure compliance by consent holders within its region and audited self-management does not reduce or

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<sup>21</sup> With inherent challenges of credibility and requirement by the industry to police non-performing members.

<sup>22</sup> Involves consultation with stakeholders in the formulation and adoption of rules and regulations.

<sup>23</sup> For example in developing sustainable catch limits within the fishing industry. However an important distinction is that in that industry adverse effects of poor management have a direct effect on members of that industry, in a way that adverse effects of poor management on water quality may not.

replace that responsibility. It is an evolutionary process that gives greater responsibility once the industry demonstrates a willingness and ability to self-manage.

- 94.** The applicant has proposed farm plans as a means of mitigation. This again is supported, to the extent that such plans, like any other plans promulgated by consent holders, provides guidance and transparency for how consent conditions will be complied with.
- 95.** Farm plans are not a substitute for consent conditions but can assist all parties: consent holders; interested parties; and regulators, by providing precise details of how consent conditions will be complied with.
- 96.** It encourages consent holders to think through the practical implementation of conditions and allows interested parties and regulators to be satisfied the procedures in place will achieve the desired outcomes.