

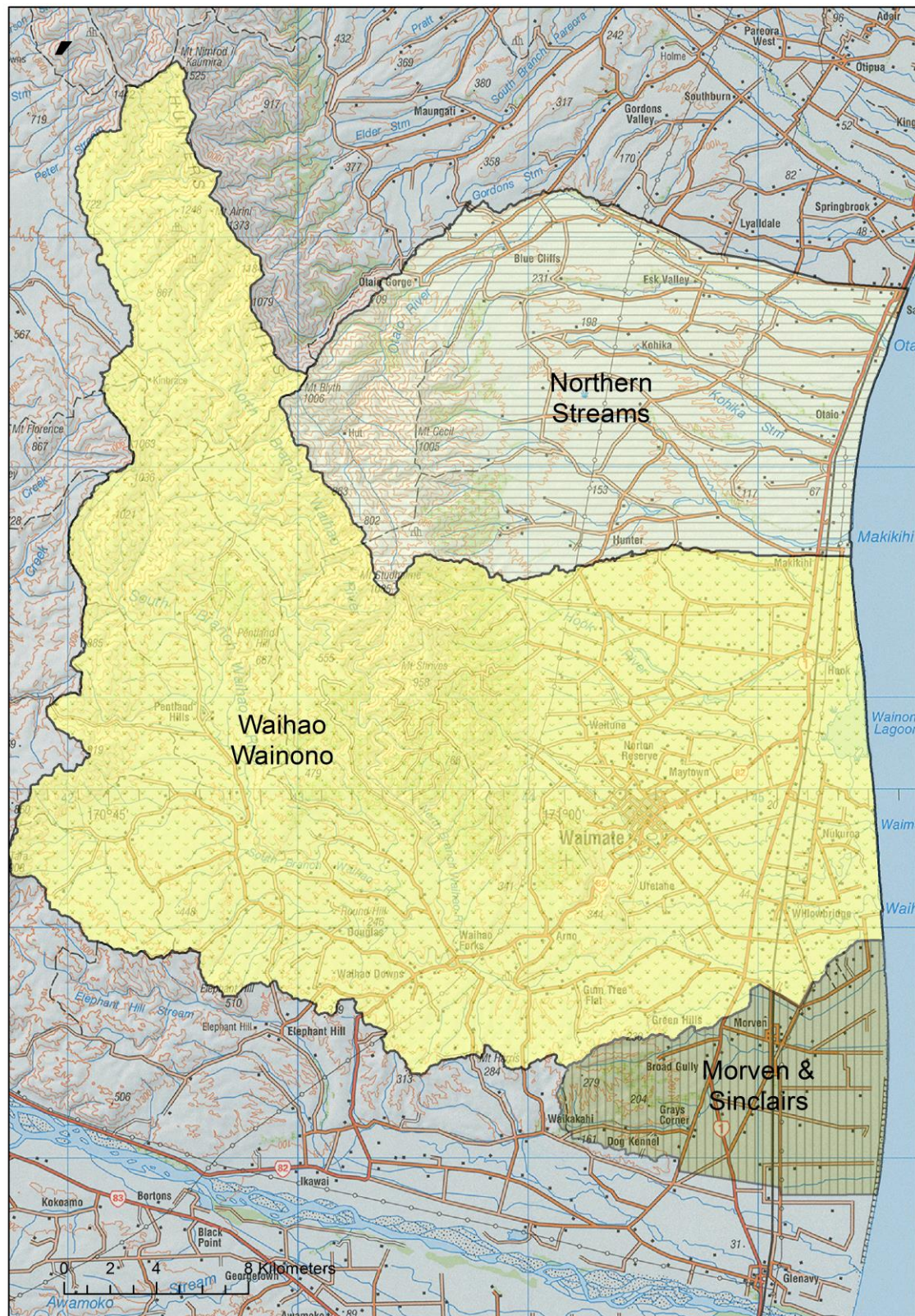
# South Coastal Canterbury ZIP Addendum

September 2014





# ZIP Addendum: South Coastal Canterbury



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## Introduction

This addendum to the Lower Waitaki South Coastal Canterbury (LWSCC) Zone Implementation Programme (ZIP) covers the area from Morven Drain in the south to the Otaio River catchment in the north. The recommendations cover both water quality and quantity limits and non-statutory actions to implement the Canterbury Water Management Strategy (CWMS) in the area. A major vehicle for implementing the recommendations will be the Waitaki and South Coastal Canterbury Sub Regional section of the Land and Water Regional Plan (LWRP). This addendum starts by outlining the outcomes the committee is seeking, the principal tensions to be resolved, and the major pathways to achieve the outcomes. The recommendations follow, along with a short commentary on each set of recommendations. The recommendations are designed to be read and implemented as an integrated package.

### Opportunity statement

There is an opportunity to improve the health and mana of Wainono Lagoon, which is considered a taonga to tangata whenua, while realising the gains from the consented Waihao Downs Irrigation Scheme (WDIS) and Hunter Downs Irrigation Scheme (HDIS). The solutions package splits the South Canterbury Coastal Streams area into three distinct parts:

1. **Waihao Wainono**, which consists of Wainono Lagoon and the rivers and streams that flow into it
2. The **Northern Streams**, consisting of Otaio River, Makikihi River, Kohika Stream and Horseshoe Bend Creek
3. **Morven Drain and Sinclairs Creek**.

The solutions package aims to reduce the trophic level for Wainono Lagoon to a Trophic Level Index (TLI) score of 6, improve Waihao and other tributary flows and habitat over time, and provide a protection level of 90% for nitrate toxicity for the streams, while the irrigated land area increases by 27,000ha via the consented WDIS and HDIS. For the Northern Streams, the package aims to improve flows and habitat over time while maintaining a protection level of 90% for nitrate toxicity, and providing for development at Good Management Practice. For Morven Drain and Sinclairs Creek, the package aims to protect the current quality of groundwater.

### Outcomes

The Zone Committee developed the following **outcomes** under the CWMS for the area.

Wainono Lagoon is a healthy ecosystem:

- Abundant mahinga kai
- Fish passage is provided throughout the catchment where appropriate
- Enhanced wetlands and protection of springs
- No further reduction in water quality of the lagoon (*acknowledging and allowing for its transitional state*)
- Catchment flows and water quality support a healthy lagoon
- Maintenance and enhancement of the Waihao Mātaimai Reserve
- Enhanced riparian management.

Vibrant economy, and sustainable growth:

- A growing local economy
- Highly reliable and secure irrigation
- Protection of Wāhi Tapu and Wāhi Taonga
- Diversity of farming systems

- Good rural and urban land management practice is common practice
- Safe water for contact recreation throughout the Zone
- Safe drinking and stock water supplies exist in the Zone
- Safe water for cultural use
- Catchment drainage and flood risk are managed.

Coastal Streams have high water quality:

- Water quality supports aquatic life and biodiversity
- Flows support aquatic life and biodiversity suitable for waterway
- Connected groundwater has healthy flows and high water quality.

### ***Major pathways***

The major pathways to achieve the outcomes are listed below and form the basis of the recommendations. They are designed as an integrated package and include: a focus on non-statutory actions, good environmental stream flows, Good Management Practice, augmentation of Wainono Lagoon, and a fully functional and funded Waihao Box.

- Support **catchment groups** for collective action and as a way of supporting practices to reduce losses of sediment, phosphorus and nitrogen.
- Use **Farm Environment Plans** (FEPs), with available templates, to facilitate and demonstrate Good Management Practices and actions.
- Realise the gains from the **Wainono Project** and a successor to the project for catchment and on-farm actions to improve Wainono Lagoon, including identification of critical source areas, sediment traps, stream battering, wetland rehabilitation and biodiversity enhancement, optimal lagoon-level management and the development of a denitrifying wetland.
- Set **Good Management Practice** (GMP) requirements for agricultural, urban and industrial discharges.
- Use a **simple framework** to support limits implementation.
- **Augment** Wainono Lagoon to improve lagoon health.
- Cap current **water allocation** and reduce over-allocation over time as new water sources become available and irrigation efficiency improves, enabling alternative sources of water and signalling a future date for implementing higher flows.
- Secure the future functioning of the **Waihao Box** through a more sustainable and equitable funding arrangement.

## 1. Waihao Wainono water quality

Wainono Lagoon is the receiving environment for the Waihao Wainono catchments and has a current TLI score of 6.5. The solution aims to hold the line at the current water quality and improve over time to a **TLI score of 6.0** (or better) and provide for a **90% protection level for nitrate toxicity** in the streams.

Good Management Practice for discharges to Wainono Lagoon is not enough to meet the water quality outcomes. Therefore significant interventions are required.

The solution contains a combination of:

- Maximising non-statutory tools to deal with phosphorus and sediment loss in the catchment, predominantly through Farm Environment Plans and the Wainono Project
- Good Management Practice requirements for nitrate loss for land use
- The augmentation of Wainono Lagoon.

The augmentation of Wainono Lagoon facilitates further development at GMP, while achieving the water quality outcomes. If augmentation does not or cannot occur, then a plan change will be required along with either another significant intervention or considerably better than Good Management Practice (for nitrate losses from land use). Augmentation is critical.

Recreational use of waterways is influenced by water quality (predominantly microbial for contact recreation and nitrate toxicity for fishing), presence of algae, and flows. This ZIP Addendum will :

- Address microbial contamination through the requirements for Farm Environment Plans, which include demonstrable actions that comply with the LWRP requirements for stock exclusion
- Cap catchment nitrogen (N) loss and require Good Management Practice on-farm to deal with N loss
- Cap water allocation at current and improve flows over time through the actions outlined in sections 5 and 6
- Address algae in waterways through riparian shading and catchment load limits for N, and management of phosphorus and improved river/stream flows through time. However, nuisance algae will persist in the area at times.



### **Recommendations: The Wainono Project, catchment groups and Farm Environment Plans**

To achieve the outcomes, the significant work stream of the Wainono Project and catchment groups must continue, along with the requirement for FEPs. This is **the key work stream for dealing with phosphorus and sediment inputs** to Wainono and for supporting work on-farm and at the catchment scale.

#### *1.1. Environment Canterbury extends the current Wainono Project, which will:*

- *Ensure the realisation of current on-the-ground actions (specifically catchment and farm-scale interventions)*
- *Include a long-term plan considering the CWMS targets to 2040 and a detailed five-year work programme containing the following components:*
  - *rehabilitation of the Hook River wetland to enable sediment capture and provide improved habitat*
  - *investigation and development of a denitrifying wetland at Hook drain*
  - *identification of the optimal level for lagoon management*
  - *consideration of land purchase or swap to enable alternative lagoon level management*
  - *identification of opportunities for wetland rehabilitation and biodiversity enhancement throughout the lower catchment, including spring-head wetlands*
  - *identification and protection of remnant mudfish populations throughout the area by avoiding habitat damage and predator (e.g. trout) access*
  - *development of riparian corridors along tributaries to improve habitat and biodiversity by shading to reduce water temperatures and periphyton risk*
  - *management of sediment including through sediment detention and targeted in-stream sediment removal*
- *Involve working with Rūnanga, Department of Conservation, Fish and Game, and local landowners.*

#### *1.2. Environment Canterbury continues to support catchment groups to deliver actions on the ground and encourages industry involvement in and support of catchment groups.*

#### *1.3. The Sub Regional section is enabling of the actions that form the Wainono Project.*

#### *1.4. The Sub Regional section requires all farms to have an FEP by 2017 to meet the LWRP requirements.<sup>1</sup>*

#### *1.5. The Sub Regional section requires FEPs to include, in particular, the identification of risks and mitigations to minimise phosphorus loss.*

### **Recommendations: The augmentation of Wainono Lagoon**

#### *1.6. Rūnanga, community irrigation schemes, water user/catchment groups, Environment Canterbury and Waimate District Council work together to advance the augmentation of Wainono Lagoon.*

#### *1.7. The Sub Regional section is enabling of the augmentation of Wainono Lagoon.*

#### *1.8. The Waitaki Catchment Water Allocation Regional Plan is enabling of the augmentation of Wainono Lagoon.*

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<sup>1</sup> Appendix One contains the descriptions of GMP to inform the preparation of FEPs.

To achieve the outcomes, a significant intervention is required. The augmentation of Wainono Lagoon with Waitaki water delivered via an irrigation company infrastructure (probably HDIS) and wetlands to the Hook River is considered the most likely and most effective intervention. The Morven Glenavy Irrigation Scheme (MGIS) currently provides an environmental flow augmentation of the lower Waihao River to help facilitate the operation of the Waihao Box and provide benefit for in-stream habitat.

- 1.9. *The Zone Committee supports the seeking of a one-off national funding contribution towards the cost of augmentation infrastructure.*
- 1.10. *Environment Canterbury and Waimate District Council investigate a funding model to support augmentation based on district and regional contributions.*

The funding of augmentation infrastructure is a critical piece of the package. While HDIS is the most likely organisation to build and deliver water to Wainono Lagoon, burdening it with the entire cost is not equitable and is risky. The wider community will benefit from the improved water quality that augmentation provides so should be expected to make a contribution to the cost, while scheme shareholders and other land users will benefit from the influence that augmentation has on limits. In addition, recommendation 1.16 provides a mechanism for land users outside a scheme to further benefit from and contribute to the cost of augmentation.



### **Recommendations: Water quality limits**

The Wainono Project and the augmentation of Wainono Lagoon enable land users to stay with GMP requirements on their discharges for nitrogen. Two irrigation schemes are consented in the area (WDIS and HDIS), and an allocation for nitrogen is provided to both of these schemes.

- 1.11. *The Sub Regional section requires Good Management Practice for nitrogen loss (N in kg/ha/yr) on all farms from 2017.*
- 1.12. *The Sub Regional section sets an N catchment load limit (tonnes/yr) for the Waihao Wainono catchment using the nutrient allocation framework outlined in Appendix Two.*
- 1.13. *The Sub Regional section is updated with GMP numbers (N in kg/ha/yr) for farming systems in 2015 at the completion of the Matrix of Good Management (MGM) project.*

All farms in Waihao Wainono will be required to meet GMP for N loss from their farming system. The exact numbers for each system will be determined by the collaborative MGM project. Increasing N loss will only be possible in the following four situations:

- Users are part of the consented WDIS and HDIS, which have their own nutrient allocation to operate
- The farming system is under the flexibility cap
- The farm is outside the irrigation schemes but purchases 'dry' or 'augmentation' shares (and is therefore part of the N load of the scheme)
- The farm is part of a formalised sub-catchment collective that does not exceed the combined flexibility cap.

- 1.14. *The Sub Regional section includes provisions for the consented community irrigation schemes (WDIS and HDIS).*
- 1.15. *Environment Canterbury works with WDIS, MGIS and HDIS to find a satisfactory method for administering and reporting on loads.*

This recommendation allows the consented irrigation schemes to proceed and gives them their own N load allocation to be managed. Both schemes' consents have water quality limits as N concentrations, while the Sub Regional section will have N mass based limits. Environment Canterbury and the schemes need to work together to reconcile the two methods, which will provide clarity for both scheme operation and regulation.

- 1.16. *The Sub Regional section enables land users outside an irrigation scheme to increase their N losses if they are a dry shareholder in the scheme, have a portion of the scheme load, and the catchment load limit is not breached.*

This recommendation allows two outcomes. First, land users outside of a scheme can contribute to the costs of augmentation. Second, it creates the option for intensification outside the scheme, provided that the scheme load is used for the intensification.

- 1.17. *The Sub Regional section provides a stepped flexibility cap and provides a maximum cap structure as outlined in Appendix Two.*

This recommendation allows low-leaching land uses to change land use and increase nutrient loss up to the flexibility cap, providing flexibility in land use for low emitters without breaching the catchment load. The maximum cap requires better than Good Management Practice over time for those above the cap, providing load reduction that could be used for additional flexibility if water quality outcomes are met.

- 1.18. *The Sub Regional section enables N load to be managed across properties operating as a formalised collective within the same sub-catchment, provided this does not exceed the maximum cap on any individual property. The collective will need to be formalised through the process. The collective is in addition to the farming enterprise approach in the proposed LWRP.*

This recommendation allows farmers to work together to manage the allocation (along the same lines as a water user group), without breaching the load limit. It therefore provides additional flexibility for operations, while protecting water quality. The sub-catchments would need to be at an appropriate scale, e.g. Hook, Waituna. The Waihao would need to be at least split into upper and lower, probably with further delineation of the Upper Waihao.

- 1.19. *Where there is load available in a catchment due to catchment actions taken to lower the load, purchase of dry shares in an irrigation scheme, or not reaching the catchment load limit, a resource consent could be used to allow access to the load (including to move beyond the flexibility cap) – within the catchment load limit.*
- 1.20. *The Sub Regional section treats urban and industrial discharges in a similar manner to agricultural discharges, with the requirement for Good Management Practice.*
- 1.21. *Environment Canterbury staff continue to work with urban and industrial dischargers as to the functioning of the Sub Regional section.*
- 1.22. *Waimate District Council prioritises the preparation of stormwater management plans in the Wainono catchment and ensures that these deal effectively with contaminants.*

Urban and industrial discharges need to have the same level of good practice required of them as rural discharges. In particular the management of Waimate township's stormwater and wastewater is of particular importance for community outcomes for Wainono Lagoon.

- 1.23. *If augmentation is not confirmed by 2020, the Sub Regional section and the methods for achieving the water quality outcomes in Waihao Wainono are reviewed.*

As augmentation has such a strong influence on limits, if augmentation does not occur, then a plan change will be needed along with either better than Good Management Practice by land users or another intervention.

#### **Recommendation: Drinking water**

- 1.24. *Environment Canterbury works with South Canterbury District Health Board and Waimate District Council to continually monitor drinking water wells in the area and, through education and advocacy, raise awareness of wells at risk.*

While the previous recommendations in this section address the cumulative effective of nitrates in the catchment, none of the scenarios tested fully removed the risk to a small number of shallow groundwater drinking wells in the lower catchment. Therefore ongoing monitoring, education and the consideration of alternative supplies are needed.

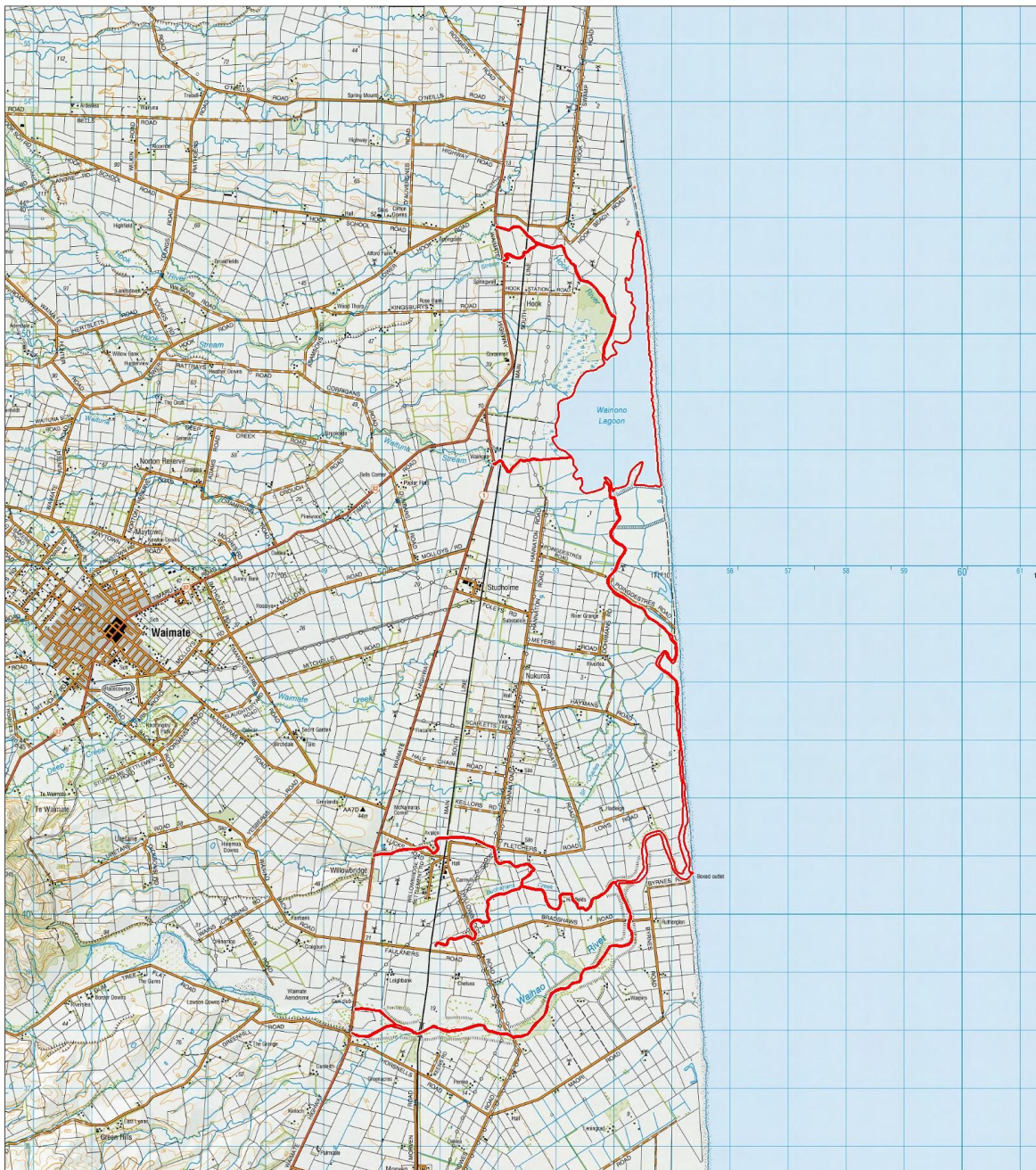
## Mātaítai

Mātaítai reserves can be established over traditional fishing grounds of special importance to local Māori.

On 16 August 2012 the Ministry for Primary Industries announced a mātaítai reserve to come into effect on 13 September 2012. The approved Waihao Mātaítai Reserve is located north-east of the Waimate township and includes the Wainono Lagoon, and the portion of the Waihao River catchment, Waituna Stream and Hook River east of the State Highway. The boundaries of the mātaítai are shown in the map below.

Establishing a mātaítai reserve does not prevent recreational fishing, or access to reserves, beaches or rivers, and does not change existing arrangements for access to private land. Only commercial fishing is prohibited in a mātaítai reserve. A mātaítai reserve only applies to species managed under the Fisheries Act 1996, which excludes whitebait and sports fish.

Part of the kaitiakitanga associated with a mātaítai reserve is the protection of water quality and stream flows. Therefore, sections 1 and 5 of this ZIP Addendum, which provide for water quality and quantity limits in Waihao Wainono, can be viewed as enhancing the Mātaítai Reserve.



## 2. Northern Streams water quality

This ZIP Addendum provides for a **90% protection level for nitrate toxicity** for the Northern Streams. It allows for further development based at Good Management Practice, while improving the flows and habitat in these streams over time, based on recommendations in section 6. **Good Management Practice is sufficient to meet water quality outcomes.**

### Recommendations : Farm Environment Plans

2.1. *All farms have an FEP by 2017 to meet the LWRP requirements.*<sup>2</sup>

2.2. *FEPs include, in particular, the identification of risks and mitigations to minimise phosphorus loss.*

FEPs are the principal tool for managing phosphorus and sediment loss as well as for demonstrating and verifying Good Management Practice.

### Recommendations: Water quality limits

2.3. *The Sub Regional section requires Good Management Practice for nitrogen loss (N in kg/ha/yr) on all farms from 2017.*

2.4. *The Sub Regional section sets an N catchment load limit (tonnes/yr) for the Northern Streams using the nutrient allocation framework outlined in Appendix Two.*

2.5. *The Sub Regional section is updated with GMP numbers for farming systems in 2015 at the completion of the Matrix of Good Management project.*

All farms in the Northern Streams will be required to meet GMP for N loss from their farming system. The exact numbers for each system will be determined by the collaborative MGM project. Land use change to increase nutrient loss will be possible up to the catchment load limit.

2.6. *The Sub Regional section provides a flexibility cap and a maximum cap structure, as outlined in Appendix Two.*

This recommendation allows low-leaching land uses to change land use and increase nutrient loss up to the flexibility cap. This provides flexibility in land use for low emitters without breaching the catchment load. The maximum cap requires better than Good Management Practice over time for those above the cap, providing load reduction that could be used for additional flexibility if water quality outcomes are met.

2.7. *The Sub Regional section enables N load to be managed across properties operating as a formalised collective within the same sub-catchment provided this does not exceed the maximum cap on any individual property. The collective needs to be formalised through the process. The collective is in addition to the farming enterprise approach in the proposed LWRP.*

This recommendation allows farmers to work together to manage the allocation (along the same lines as a water user group), without breaching the load limit. It therefore provides additional flexibility for operations, while protecting water quality. The sub-catchments would need to be at an appropriate scale, e.g. Hook, Waituna. The Waihao would need to be at least split into upper and lower, probably with further delineation of the Upper Waihao.

2.8. *Where there is load available in a catchment due to catchment actions taken to lower the load, purchase of dry shares in an irrigation scheme, or not reaching the catchment load limit, a*

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<sup>2</sup> Appendix One contains the descriptions of GMP to inform the preparation of FEPs.

*resource consent could be used to allow access to the load (including to move beyond the flexibility cap) – within the catchment load limit.*

- 2.9. Urban and industrial discharges are treated in a similar manner to agricultural discharges, with the requirement for Good Management Practice.*
- 2.10. Environment Canterbury staff continue to work with urban and industrial dischargers as to the functioning of the Sub Regional section.*
- 2.11. Waimate District Council reviews the efficacy of community septic tank management in St Andrews.*

### 3. Morven Drain and Sinclairs Creek water quality

Morven Drain and Sinclairs Creek are groundwater-fed catchments outside the catchment of Wainono Lagoon. The package aims to hold the line at current groundwater quality, which will require GMP and FEPs. **Good Management Practice is sufficient to meet water quality outcomes.**

#### **Recommendation: Farm Environment Plans**

*3.1. All farms have an FEP by 2015 to meet the LWRP requirements<sup>3</sup> and FEPs held by MGIS are modified to align with the LWRP.*

FEPs are the principal tool for managing phosphorus and sediment loss as well as for demonstrating and verifying Good Management Practice

#### **Recommendations: Water quality limits**

*3.2. The Sub Regional section requires Good Management Practice for nitrogen loss (N in kg/ha/yr) on all farms from 2017.*

*3.3. The Sub Regional section sets an N catchment load limit (tonnes/yr) for Morven Drain and Sinclairs Creek using the nutrient allocation framework outlined in Appendix Two.*

*3.4. The Sub Regional section is updated with GMP numbers for farming systems in 2015 at the completion of the Matrix of Good Management project.*

All farms in Morven Drain and Sinclairs Creek will be required to meet GMP for N loss from their farming system. The exact numbers for each system will be determined by the collaborative MGM project.

Further conversion from border dyke to spray irrigation in Morven Drain and Sinclairs Creek will lower the current N load. Therefore it allows the spare load to be used for further intensification within the catchment managed by the irrigation scheme or managed by Environment Canterbury for load outside the irrigation scheme, without breaching the load limit.

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<sup>3</sup> Appendix One contains the descriptions of GMP to inform the preparation of FEPs.



## 4. The Waihao Box

The Waihao Box is an integral infrastructure asset that facilitates the flow of water between the Waihao River and Wainono Lagoon, and between Wainono Lagoon and the sea. It is currently undergoing repair. Its maintenance is 80% funded by 23 adjoining landowners. This funding model is not considered sustainable in the long term.

### Recommendations

- 4.1. Environment Canterbury amends the proportional contributions to the Waihao Box maintenance through the 2014 annual plan process, to more accurately reflect the district and regional importance of Wainono Lagoon and the place of the Waihao Box in managing water quality, fish passage and drainage.*
- 4.2. Environment Canterbury reviews the options for catchment-wide rating in the Waihao Wainono catchments in light of the Sub Regional section, the Wainono Project and community irrigation scheme development.*
- 4.3. Environment Canterbury considers alternative sources for one-off funding to complete necessary repairs to the Waihao Box.*

## 5. Waihao Wainono flow and allocation

During 2012 a flow and allocation regime was developed for Waihao Wainono which limits abstraction to the current consented allocation, with the aim of preventing any further decline in habitat and protecting current reliability. This regime will 'hold the line' until new water is available in the catchment. To improve in-stream habitat while protecting irrigation reliability, flows will be raised once new water (consented Waitaki) is available in the catchment.

### Recommendations

*The Sub Regional section will:*

- 5.1. *Recognise the flow and allocation regime developed in **2012** for the Waihao catchment (including Buchanans, Sir Charles and Waimate creeks) and the Wainono catchment (including Hook River and Merrys Stream), by initially capping allocation at existing levels to prevent any further decline in habitat*

The recently developed flow and allocation regime will cap allocation and prevent decline in habitat.

- 5.2. *Require a target of 80% **application efficiency**; the amount of water abstracted will be reasonable for the intended use and all systems are to be designed to maximise efficient use of water, including the improvement over time of existing systems*
- 5.3. *Make **damming** of the full flow of the rivers and streams at certain sites a prohibited activity and avoid damming in high naturalness water bodies*
- 5.4. *Provide for out-of-stream storage to be considered as long as it complies with the flow and allocation regime, does not impede fish passage, does not prevent water being taken for domestic or stock water, and does not reduce the reliability of any existing consent*
- 5.5. *Make out-of-stream **water storage** as permissible as possible*
- 5.6. *Restrict **transfers** until allocation limits are met, while enabling transfers where there is an environmental benefit*
- 5.7. *Encourage the use of **scheme water** when it becomes available to reduce over-allocation of surface water, including not re-allocating surrendered takes until allocation limits allow*
- 5.8. ***Cap allocation** at existing allocation and reduce over time by only re-allocating water to consent holders at a rate and volume that reflect a combination of both demonstrated and reasonable use*
- 5.9. *Provide **partial restrictions** to prevent flows falling below the minimum flow. Some will be stepped and some pro rata depending on the location of the minimum flow site*
- 5.10. *Encourage the formation of **water user groups***
- 5.11. *Require that takes of 5L/s or more are **metered**, and that data are telemetered to Environment Canterbury*
- 5.12. *Cap groundwater allocation at current allocation*
- 5.13. *Provide a groundwater 'B' block that is no greater than the sum of current stream-depleting groundwater and surface-water takes that could switch to deep groundwater*
- 5.14. *Allow current surface-water and stream-depleting groundwater takes to switch to deep groundwater where there is:*
  - i. *a net environmental benefit*
  - ii. *no demonstrable effect on existing groundwater takes.*

These recommendations will provide improved flows in streams while protecting irrigation reliability and security by allowing a small number of surface and shallow groundwater takes to swap to deep groundwater. These takes would be finite in number and restricted by access to deep groundwater, as well as by requirements for a demonstrable positive environmental effect and no negative effect on existing takes. Groundwater takes would be capped at current levels and a small B block provided for those who can swap. Deep groundwater would not be opened up to new allocation.

*5.15. In **2025**, the Sub Regional section will introduce a flow and allocation regime based on mana whenua flows, if alternative sources of irrigation scheme water are available.*

*5.16. Environment Canterbury staff continue to work with communities on the details of the 2025 flows.*

If alternative sources of water are provided in the catchment by 2025 (e.g. Waitaki water via the WDIS and HDIS), then a flow and allocation regime that more fully meets mana whenua and environmental outcomes is introduced based on cultural reports used in the scenario process and the proposed National Environmental Standard on Ecological Flows and Water Levels. Environment Canterbury staff will continue to work collaboratively with communities on the details of these flows.

## 6. Northern Streams flow and allocation

The intermittent Otaio, Makikihi, Kohika and Horseshoe Bend make up the Northern Streams. Water has been allocated from these waterways in the past on a consent by consent process. Currently there is no environmental flow and allocation regime in the LWRP for these northern streams. The National Policy Statement (NPS) for Freshwater Management 2011 requires the setting of limits in all rivers and streams and the community are working alongside the Zone Committee and Environment Canterbury staff to determine an appropriate regime. The Sub Regional section will cap allocation at June 2014 levels and reduce allocation over time through transfers, storage, alternative water sources, and application efficiency. To improve in-stream habitat while protecting irrigation reliability, flows will be reviewed once new water (consented Waitaki) is available in the catchment.

### Recommendations

- 6.1. *The Sub Regional section will develop a **2014** flow and allocation regime that caps allocation at the current level and identifies minimum flow sites and flows that protect the in-stream values particular to that waterway.*
- 6.2. *Environment Canterbury staff continue to work with the catchment community on the detailed regime.*

Detailed investigations and engagement were carried out over summer 2013/14 by locals and Environment Canterbury to help identify what these flows will be.

*The Sub Regional section will:*

- 6.3. *Require a target of 80% **application efficiency**; the amount of water abstracted will be reasonable for the intended use and all systems are to be designed to maximise efficient use of water, including the improvement over time of existing systems*
- 6.4. *Make **damming** of the full flow of the rivers and streams at certain sites a prohibited activity and avoid damming in high naturalness water bodies*
- 6.5. *Provide for out-of-stream storage to be considered as long as it complies with the flow and allocation regime, does not impede fish passage, does not prevent water being taken for domestic or stock water, and does not reduce the reliability of any existing consent*
- 6.6. *Make out-of-stream **water storage** as permissible as possible*
- 6.7. *Restrict **transfers** until allocation limits are met, while enabling transfers where there is an environmental benefit. In particular, a small number of shallow groundwater and surface-water takes have been identified that could be transferred to deep groundwater for a net environmental benefit*
- 6.8. *Encourage the use of **scheme water** when it becomes available to reduce over-allocation of surface water, including not re-allocating surrendered takes until allocation limits allow*
- 6.9. ***Cap allocation** at existing allocation and reduce over time by only re-allocating water to consent holders at a rate and volume that reflect a combination of both demonstrated and reasonable use*
- 6.10. *Provide **partial restrictions** to prevent flows falling below the minimum flow. Some will be stepped and some pro rata depending on the location of the minimum flow site*
- 6.11. *Encourage the formation of **water user groups***
- 6.12. *Require that takes of 5L/s or more are **metered**, and that data are **telemetered** to Environment Canterbury*
- 6.13. *Cap groundwater allocation at current allocation*

- 6.14. *Provide a groundwater 'B' block that is no greater than the sum of current stream-depleting groundwater and surface-water takes that could switch to deep groundwater*
- 6.15. *Allow current surface-water and stream-depleting groundwater takes to switch to deep groundwater where there is:*
- i. a net environmental benefit*
  - ii. no demonstrable effect on existing groundwater takes.*

These recommendations will provide improved flows in streams while protecting irrigation reliability and security by allowing a small number of surface and shallow groundwater takes to swap to deep groundwater. These takes would be finite in number and restricted by access to deep groundwater, as well as requirements for a demonstrable positive environmental effect and no negative effect on existing takes. Groundwater takes would be capped at current levels and a small B block provided for those who can swap. Deep groundwater would not be opened up to new allocation.

- 6.16. *In **2025**, the Sub Regional section will introduce a flow and allocation regime based on mana whenua flows, if alternative sources of irrigation scheme water are available.*

If alternative sources of water are provided in the catchment by 2025 (e.g. Waitaki water via the WDIS and HDIS), then a flow and allocation regime that more fully meets mana whenua and environmental outcomes is introduced based on cultural reports used in the scenario process and the draft National Environmental Standard on Ecological Flows and Water Levels. Environment Canterbury staff will continue to work collaboratively with communities on the details of these flows.

## 7. Implementation, monitoring and review

A key part of the package is monitoring and review. In 2025 the Sub Regional section will implement higher mana whenua and environmental river/stream flows if a new water source is available in the catchment via community irrigation schemes. A plan review will need to assess the effectiveness of the water quality limits and non-statutory actions in delivering on the water quality outcomes. It is also envisaged that what is considered GMP will be reviewed and updated by Environment Canterbury and industry over time.

### Recommendations

*7.1. Environment Canterbury reviews the Sub Regional section in 2025 in terms of progress that has been made towards achieving environmental outcomes and, on this basis, initiates a plan change to revise any or all of:*

- i. GMP numbers (e.g. N in kg/ha/yr)*
- ii. the catchment load limits*
- iii. the allocation of the load*
- iv. the methods for achieving water quality outcomes in Waihao Wainono if augmentation has not happened*
- v. Environmental flow regimes.*

*7.2. There is no implied property right to N loss.*

*7.3. Environment Canterbury and industry review and update GMP as technology, practice and cost-effectiveness change over time.*

*7.4. Environment Canterbury carries out technical investigations to support the review in 2025 such as:*

- The properties of loess soils and contaminant loss under irrigation on loess soils*
- The long-term sustainability of deep groundwater abstractions through increasing understanding of aquifer recharge and discharge flow time (i.e. groundwater age).*

*7.5. Environment Canterbury implements a monitoring programme to inform future plan reviews and progress towards catchment outcomes.*



## Appendix One: Good Management Practices for farming activities

1. **Nutrient management:** To maximise nutrient use efficiency while minimising nutrient losses to water in order to meet specified nutrient allowances.

### **Required outcomes**

- a. Preparation of a nutrient budget using OVERSEER® by a person who can demonstrate competency in agricultural nutrient management, using appropriate protocol;
- b. Demonstration that the amount of N and P applied from all sources does not exceed that required for desired level of production and maintenance of soil fertility at optimal levels;
- c. Demonstration that nitrogen conversion efficiency is within or above the range of benchmark farms referenced within OVERSEER®;
- d. Demonstration that phosphate and sediment losses to ground and waterways are minimised by management of critical source areas;
- e. Demonstration that fertiliser is applied evenly in accordance with the Fertmark and Spreadmark codes of practice.

2. **Irrigation management:** To operate irrigation systems that are capable of applying water efficiently and management that ensures actual use of water is monitored and efficient.

### **Required outcomes**

- a. Demonstration that the irrigation system used is capable of applying water with an efficiency exceeding 80%, measured as the depth of water retained within the root zone divided by the total depth applied; or
- b. Demonstration that where the irrigation system used is not capable of applying water with an efficiency exceeding 80%, demonstrate that the system is used as efficiently as practicable.
- c. Demonstration that there are methods and systems in place to ensure the depth of water applied does not exceed that required to return soil moisture to field capacity. These shall include but not be limited to:
  - i. Method for measuring available water-holding capacity across the area irrigated taking account of variability;
  - ii. System for measuring soil moisture, taking account of variability across the area irrigated;
  - iii. System for measuring the depth of water applied over a particular area and time period; and
  - iv. System for recording information necessary to demonstrate each of the above.
- d. All staff involved in the operation and maintenance of the irrigation system are suitably trained.

3. **Soils management:** To maintain or improve the physical and biological condition of soils in order to minimise the movement of sediment, phosphorus and other contaminants to waterways.

### **Required outcomes**

- a. Demonstration that erosion caused by land use activities is minimised;
- b. Demonstration that soils are well-managed to optimise infiltration and minimise runoff.

4. **Wetlands and riparian management:** *To manage wetland and waterway margins to avoid damage to the bed and margins of a water body, avoid direct input of nutrients, and to maximise riparian margin nutrient filtering.*

**Required outcomes**

- a. Demonstration of compliance with LWRP rules related to use and management of land adjacent to wetlands and waterways;
- b. Demonstration of measures taken to ensure stock damage to waterways and wetlands is minimised;
- c. Demonstration that farm practices including location and intensity of runoff minimise soil, nutrient and faecal contamination of waterways.

5. **Collected animal effluent management:** *To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant at all times.*

**Required outcomes**

- a. Demonstration that effluent management and discharge complies with LWRP rules related to collected animal effluent management and any conditions of resource consents;
- b. Demonstration that effluent is applied evenly and consistent with guidance provided in DairyNZ's 'A Guide to Managing Dairy Farm Effluent'.

6. **Livestock management:** *To manage wetlands and water bodies so that stock are excluded as far as practicable from water, to avoid damage to the bed and margins of a water body, and to avoid the direct input of nutrients, sediment and microbial pathogens.*

**Required outcomes**

- a. Demonstration of compliance with LWRP rules related to livestock management adjacent to wetlands and waterways;
- b. Demonstration of measures taken to ensure stock are excluded as far as practicable from water and to avoid the direct input of nutrients, sediment and microbial pathogens.

## Appendix Two: Load limits

Table A: Draft N-load limits for farming

| Catchment                                                                                        | Timing                    | *#Load limit (t/yr)                                                                                                | What does this mean for environment outcomes?                                                                                                                                                                                                                                                                                                     | What does this mean for land users?                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Waihao-Wainono</b><br>(Waihao, Buchanan, Sir Charles, Waimate, Waituna, Hook, Coastal Drains) | From April 2015           | Existing use <sup>4</sup><br>@2015; 680<br>@2025; 680 minus<br>max cap reductions                                  | <ul style="list-style-type: none"> <li>Wainono water quality initially declines from <b>TLI 6.5 to 6.7</b> (assume only WD scheme proceeds before augmentation)</li> <li>Meets at least 90% protection for N-toxicity in streams</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul> | <ul style="list-style-type: none"> <li>All users at GMP by 2017; Max Caps apply as per Table B &amp; C</li> <li>Flexibility cap allows N loss increase up to 10 kg/ha/yr</li> <li>No other increase in N loss is allowed unless the user has rights to part of the load allocated to a consented scheme</li> <li>Allows consented HDI &amp; WD land use change to get started</li> </ul>                                                                                                |
|                                                                                                  | After augmentation (2020) | HDI & WD <sup>5</sup><br>227 minus max cap reductions                                                              | <ul style="list-style-type: none"> <li>Can probably achieve Wainono target outcome <b>TLI 6.0</b></li> <li>Meets at least 90% protection for N-toxicity in streams</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>                                                               | <ul style="list-style-type: none"> <li>All users at GMP; Max Caps apply as per Table B &amp; C</li> <li>Flexibility cap increases from 10 to 15 kg/ha/yr</li> <li>Allows HDI &amp; WD land use change &amp; dryland dairy support</li> <li>All users benefit from augmentation because this reduces the possibility that load limit reductions and/or other regulatory changes could be considered if environmental outcomes are not being met at time of future plan review</li> </ul> |
|                                                                                                  | From 2025                 | Flexibility load <sup>6</sup><br>@2020; 214<br>@2025; 214 plus<br>max cap gains<br><b>Total<sup>7</sup> = 1121</b> | <ul style="list-style-type: none"> <li>Assuming all water quality outcomes are now met</li> </ul>                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>All users at GMP and operating below Max Caps</li> <li>Flexibility cap increases to target of 17 kg/ha/yr</li> </ul>                                                                                                                                                                                                                                                                                                                             |
| <b>Northern Streams</b><br>(Otaio, Kohika, Horseshoe, Makikihi)                                  | From April 2015           | Otaio <sup>8</sup> = 169<br>Kohika <sup>8</sup> = 96<br>Horseshoe <sup>8</sup> = 51<br>Makikihi <sup>8</sup> = 145 | <ul style="list-style-type: none"> <li>Meets at least 90% protection for N-toxicity in streams</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>                                                                                                                                   | <ul style="list-style-type: none"> <li>All users at GMP by 2017; Max Caps apply as per Table B &amp; C</li> <li>Flexibility cap allows N loss increase up to 15 kg/ha/yr</li> <li>Allows for consented HDI land use change; any land use change or intensification that increases N loss above 15 kg/ha/yr prior to HDI will be by consent and will be accounted as part of the total allocation – HDI may utilise remaining available load up to the limit</li> </ul>                  |
|                                                                                                  | From 2025                 |                                                                                                                    | <ul style="list-style-type: none"> <li>Assuming all water quality outcomes are now met</li> </ul>                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>All users at GMP and operating below Max Caps</li> <li>Flexibility cap increases to target of 17 kg/ha/yr</li> </ul>                                                                                                                                                                                                                                                                                                                             |
| <b>Morven - Sinclairs</b>                                                                        | From April 2015           | Morven <sup>9</sup> = 307<br>Sinclairs <sup>9</sup> = 61                                                           | <ul style="list-style-type: none"> <li>Meets current quality in Morvens &amp; Sinclairs</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>                                                                                                                                          | <ul style="list-style-type: none"> <li>All users at GMP by 2017</li> <li>As N load reduces through time (by border-dyke to spray conversions) this load may be managed by MGI Scheme for land use change or intensification within catchment only</li> </ul>                                                                                                                                                                                                                            |

\*Note all load limits include an allowance of up to 5 kg/ha/yr for all "steep hill" areas as defined by soil types Hurunui and Class 7 in the SCCS soil maps.

# Note load limits are draft placeholders based on 2014 Look-up Tables (Overseer Version 6) and will be re-calculated once GMP numbers (kg/ha/yr) are agreed via the Matrix of Good Management (MGGM) Project.

<sup>4</sup> Calculated as Current land-use x GMP (kg/ha/yr) for 2015. For 2025 the existing load above Maximum Caps (see Tables B & C) has been subtracted.

<sup>5</sup> Calculated as Scenario 2 (HDI & WD) land-use x GMP (kg/ha/yr) minus the load above Maximum Caps; (Assumed land-use mix for new irrigation 70% dairy; 10% arable; 10% sheep, beef, deer; 10% dairy support) – The load will be allocated between HDI and WD in proportion to each scheme's area once the scheme areas have been finalized.

<sup>6</sup> Calculated for 2020 as the sum of assumed dryland dairy support (146t) and nominal 10% intensification (68t) components of Scenario 2 land-use. For 2025 load gains above Maximum Caps are added.

<sup>7</sup> Calculated as Scenario 2 land-use x GMP (kg/ha/yr); (Assumed land-use mix for new irrigation 70% dairy; 10% arable; 10% sheep, beef, deer; 10% dairy support)

<sup>8</sup> Calculated as Scenario 2 land-use x GMP (kg/ha/yr); (Assumed land-use mix for new irrigation 70% dairy; 10% arable; 10% sheep, beef, deer; 10% dairy support)

<sup>9</sup> Calculated as Current land-use x GMP (kg/ha/yr)

**Table B: Nitrogen allocation framework for farming**

| Framework = Good Management Practice with a Flexibility Cap and a Maximum Cap<br>Waihao Wainono and Northern Streams |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>2015</b><br><b>Step 1</b>                                                                                         | <p><i>Working to Good Management Practice</i> for all users as per the MGM Project</p> <p><i>Flexibility cap</i> of 10kgs/ha/yr for low emitters in Waihao Wainono and 15kgs in Northern Streams.</p> <p>The flexibility cap for “steep hill” areas (defined as Hurunui and Class 7 soils) remains at 5 kg/ha/yr in all catchments from 2015 onwards.</p> <p><i>Maximum Cap</i> levels are clearly signalled and the timeframe for existing users to get there. New users meet the max cap from Step 1.<br/>(As per table below)</p>                                                          | <b>Plan Operative</b>               |
| <b>By 2020</b><br><b>Step 2</b>                                                                                      | <p><i>Good Management Practice</i> for all users as per the MGM Project</p> <p><i>Flexibility Cap</i> in Waihao Wainono increases to 15kgs</p> <p>A plan must be produced by existing high emitters to show progress and methods to get down to <i>Maximum Cap</i> by 2025.<br/>(New scheme users and new conversions must meet the <i>Maximum Cap</i> immediately)</p>                                                                                                                                                                                                                       | <b>If Augmentation has occurred</b> |
| <b>2025</b><br><b>Step 3</b>                                                                                         | <p><i>Good Management Practice</i> for all users as per the MGM Project</p> <p>High emitters have reduced to the <i>Maximum Cap</i></p> <p>If water quality outcomes are being met, then the gains made from the <i>Maximum Cap</i> reductions are available to:</p> <ul style="list-style-type: none"> <li>provide additional <i>flexibility</i> for low emitters to a target of 17kgs/ha/yr</li> <li>provide for any existing high emitters on XL soils that are unable to meet the 35kgs maximum cap – by application for resource consent with a strong justification required</li> </ul> | <b>Plan review</b>                  |

**Table C: Maximum caps for farming**

| Maximum Cap for Waihao Wainono and Northern Streams (kg/ha/yr) | Soils     | New Users (HDI + WD + any other new converters) | Existing Users                                     |                 |
|----------------------------------------------------------------|-----------|-------------------------------------------------|----------------------------------------------------|-----------------|
| 35                                                             | XL, VL, L | Achieve immediately on conversion               | Must prepare a plan by 2020 showing how to achieve | Achieve by 2025 |
| 25                                                             | M, H, D   |                                                 |                                                    |                 |
| 20                                                             | Pd, PdI   |                                                 |                                                    |                 |

**Table D: Draft N-load limits for urban and industrial discharges**

| Catchment                 | Timing          | Load limit (t/yr)                                                 | What does this mean for users?                                                                                                                                                                                                                    |
|---------------------------|-----------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Waihao-Wainono</b>     | From April 2015 | 40 (milk processing wastewater)<br>2 (Waimate community sewerage) | <ul style="list-style-type: none"> <li>Fonterra factory milk processing wastewater may continue within current total loading rate</li> <li>Waimate community wastewater treatment plant may continue within current total loading rate</li> </ul> |
| <b>Northern Streams</b>   | From April 2015 | 8 (potato processing wastewater)                                  | <ul style="list-style-type: none"> <li>Makikihi factory potato processing wastewater may continue within current total loading rate</li> </ul>                                                                                                    |
| <b>Morven - Sinclairs</b> | From April 2015 | 0                                                                 | <ul style="list-style-type: none"> <li>There are no existing urban or industrial discharges and no load is provided for new discharges</li> </ul>                                                                                                 |

