Morven Glenavy Ikawai Irrigation Company Limited

Including

Waihao Downs Irrigation

ENVIRONMENTAL MANAGEMENT STRATEGY

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Morven Glenavy Ikawai Irrigation Company Limited

Environmental Management Strategy

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1 Introduction

This Environmental Management Strategy outlines the commitment that Morven Glenavy Ikawai Irrigation Company Ltd (MGI) and Waihao Downs Irrigation Ltd (WDI) have made to a pro-active approach to environmental management in all aspects of the development, operation and maintenance of the schemes.

It describes how MGI and WDI ("the schemes") and their water users will jointly manage environmental issues, including the use of Farm Environment Plans (FEPs), independent audits, and robust compliance and enforcement.

The schemes recognise that they are operating under a wider sustainable management framework, in particular the Canterbury Water Management Strategy (CWMS), the Land and Water Regional Plan and the Lower Waitaki South Coastal Canterbury Zone Implementation Programme (ZIP).

This Environmental Management Strategy has been developed in accordance with the conditions of resource consents CRC091997 and CRC184153 (MGI), CRC180558 and CRC164369 (WDI), but it is applicable to all MGI resource consents and activities.

MGI adopted an initial Environmental Management Strategy (EMS) for the Morven Glenavy Ikawai Irrigation scheme in October 2010. The EMS now includes the matters required under CRC184153 (MGI pending), CRC180558 and CRC164369 (WDI) for a 'Scheme Management Plan'.

The consented command areas for MGI and WDI are shown in Appendix 1.

2 Governance and Management

Morven Glenavy Ikawai Irrigation Company Ltd is a co-operative company with seven directors. Waihao Downs Irrigation Ltd is a wholly owned and operated subsidiary of MGI.

The two schemes have separate resource consents for scheme operation, although WDI shares the MGI intake structure at Stonewall. The WDI scheme began providing water in the 2016-17 irrigation season. The two schemes are managed together using the same staff and many of the same contractors. There is some overlap in the consented command areas for the two schemes.

A single GIS-based data management system is used for scheme asset management and for individual farm information, including shareholders, land parcels, irrigated areas, water metering and Farm Environment Plans.

3 Sustainability Policy and Principles

The schemes are committed to ensuring that they are viable and contribute lasting benefits to society. Through consideration of social, cultural, environmental, ethical and economic aspects in all that they do, they will seek a balance between agricultural productivity and environmental protection, both of which are essential for the long-term productivity and sustainability of the area.

Sustainability Policy

MGI and WDI aim to be leaders in sustainable irrigation performance in New Zealand, and will develop, implement and maintain systems for sustainable management to drive continual improvement in performance and will strive to:

- Meet or, where less stringent than our own standards, exceed applicable legal requirements, including our resource consent conditions;
- Promote continual improvement in responsible and efficient use of water and other natural resources;
- Ensure that our shareholders understand their environmental responsibilities and support them in reaching the required standards, particularly through the Farm Environment Plan and audit processes;
- Understand, uphold and respect cultural heritage, in particular respecting the Ngai Tahu values in relation to water, the natural environment and other taonga[1];
- Actively enhance biodiversity values, wherever possible, within our operation;
- Engage regularly, openly and honestly with people affected by the scheme operations and have processes in place to act on concerns associated with irrigation activities;
- Develop and maintain positive relationships with industry partners and local communities;
- Track and regularly review our environmental performance and report to shareholders, Canterbury Regional Council and others.

[1] Sacred treasure, valuables

4 Environmental Objectives and Targets

The strategic outcomes that this Environmental Management Strategy seeks to achieve are:

- Promote and enhance sustainable irrigation management
- Manage nitrogen and phosphorus loads in streams and rivers within acceptable levels
- Protect ecologically important wetlands and their habitats
- Effective and efficient irrigation without over-allocation
- Farming activities that meet or exceed Good Management Practice (GMP) requirements
- Develop, maintain and enhance economically sustainable farming
- Understand and respect for Ngai Tahu values in relation to freshwater

In order to achieve these outcomes, the schemes have identified key management areas and an objective and one or more targets for each. These objectives and targets include those required by the Canterbury Land and Water Regional Plan (LWRP).

The irrigation scheme operations must be integrated with the underlying farms in order to achieve holistic environmental management. Scheme-level objectives and targets may differ from those at the farm-level and so this section is structured accordingly. Tables 1 & 2 (below) sets out the objective and targets for each management area.

Table 1: Irrigation Scheme Level Objectives and Targets

Outcome Area	Objective	Targets
Irrigation Management	a) To meet at least 80% conveyance efficiency of water from the intake to the farms b) To ensure that all new irrigation systems and significant upgrades meet MGI/WDI resource consent conditions and industry best practice standards	• That scheme efficiency is at least 80% • All staff involved in the operation and maintenance of the irrigation system are suitably trained • Irrigation systems are designed and installed to: o meet the current Irrigation NZ Design and Installation codes of practice and standards o minimise and, wherever possible, avoid the application of irrigation water onto non-productive land, such as impermeable surfaces (including roads) and river or stream margins
Water Quality	c) To minimise any adverse effects of the irrigation scheme on surface and groundwater quality and promoting practices that can improve water quality through collaborative catchment management.	• That nutrient losses shall be at or below the consented loss rates; • There shall be no direct runoff of sediment from irrigation activities; • There are increases in the amount of riparian planting in the scheme area and no loss of wetland habitat; • The scheme shall fund community riparian planting projects by at least $1/hectare of irrigated land.
Biodiversity	d) To promote the safeguarding of significant indigenous biodiversity and ecosystem values within the scheme command area.	• As per water quality targets above
Mahinga Kai Values	e) To protect mahinga kai values in the scheme area	• Farm management practices collectively protect mahinga kai values on farm; and within catchments.
Farm Environment Plans	f) Operate and maintain a highly effective Farm Environmental Plan process, working positively with farmers to achieve a 100% pass rate	• All farms achieve A or B audit grades

Table 2: Farm-level Objectives and Targets

Outcome Area	Objective	Targets
Irrigation Management	g) The amount and timing of irrigation is managed to meet plant demands, minimise risk of leaching and run-off and ensure efficient water use h)	• The performance of irrigation systems is assessed annually (including bucket testing), and irrigation systems are maintained and operated to apply water at their optimal efficiency • Minimum irrigation efficiency is 80% • The timing and depth of irrigation water applied takes account of crop requirements and is justified through soil moisture monitoring or soil water budgets and climatic information • All staff involved in the operation and maintenance of the irrigation system are suitably trained • Irrigation systems are designed and installed to: o meet the current Irrigation NZ Design and Installation codes of practice and standards o minimise and, wherever possible, avoid the application of irrigation water onto non-productive land, such as impermeable surfaces (including roads) and river or stream margins
Nutrient Management	a) To use nutrients efficiency while minimising nutrient losses to water b) Nutrient losses do not exceed consented nitrogen loss limits	• Nitrogen losses from farming activities are at or below the: a. Baseline GMP Loss Rate or Good Management Practice Loss Rate (whichever is the lesser) or b. consented nitrogen loss limits • Available nitrogen loss mitigation measures (excluding those associated with irrigation, fertiliser or effluent management) are implemented • Phosphorus and sediment losses from farming activities are minimised • Manage the amount, timing and application of fertiliser inputs to match the predicted plant requirements and minimise nutrient losses

Outcome Area	Objective	Targets
		• Synthetic nitrogen is applied at a rate that achieves compliance with regional council rules. • Store and load fertiliser to minimise the risk of spillage, leaching and loss into water bodies
Cultivation & Soils Management	The physical and biological condition of soils is maintained or improved in order to minimise the movement of sediment, phosphorus and other contaminants to waterway	• Farming activities are managed so as to not exacerbate erosion • Farming practices are implemented that optimise infiltration of water into the soil profile and minimise run-off water, sediment loss and erosion • Scheme race easements are grazed with 1 healthy cow per 1,000 m^2 or light weight stock such as sheep to minimise the risk of over-grazing, pugging and sediment loss • Intensive winter grazing is undertaken to good management practice standards and is compliant with regional council rules
Animal Effluent & Collected Solid Animal Waste	To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant 365 days of the year. Animal effluent and solid animal waste is managed to minimise nutrient leaching and run-off	• Effluent systems meet industry Codes of Practice or an equivalent standard • The timing and rate of application of effluent and solid animal waste to land is managed so as to minimise the risk of contamination of groundwater or surface water bodies • Application of effluent to land will be determined by measured soil moisture, and account for soil and weather conditions • Sufficient and suitable storage is available to enable animal effluent and wash-down water to be stored when soil conditions are unsuitable for application • Staff are trained in the operation, maintenance and use of effluent storage and application systems

Outcome Area	Objective	Targets
Waterbodies (wetlands, riparian areas, drains, rivers, lakes) & In-stream Biodiversity Values	Wetlands, riparian areas and the margins of surface waterbodies are managed to avoid damage to the bed and margins of the water body, and to avoid the direct input of nutrients, sediment and microbial pathogens. To protect and enhance in-stream biodiversity values	• Stock are excluded from waterbodies in accordance with regional council rules or any granted resource consent • Vegetated riparian margins of sufficient width are maintained to minimise nutrient, sediment and microbial pathogen losses to waterbodies, • Farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallow and other farming activities that are potential sources of sediment, nutrient and microbial loss are located so as to minimise the risk to surface water quality • Prioritise the achievement of the targets for the Management Area: Waterbody for any spread heads, wetlands and spring-fed streams so as to protect and enhance the instream biodiversity values
Point Sources (offal pits, farm rubbish pits, silage pits)	The number and location of pits are managed to minimise risks to health and water quality	• All on-farm silage, offal pit and rubbish dump discharges are managed to avoid direct discharges of contaminants to groundwater or surface water • All on-farm offal and silage pits comply with regional council rules
Water-use (excluding irrigation water)	To use water efficiently ensuring that actual use of water is monitored and efficient	• Actual water usage is efficient and appropriate for the end use • Water meters are installed and verified according to manufacturer's specifications and operate within +/- 5% accuracy
Mahinga kai	To protect mahinga kai values	• Mahinga kai values of surface waterbodies on the property are recognised by achieving other objectives and targets in the Farm Environment Plan, and in addition by: a) maintaining existing indigenous vegetation in accordance with relevant regional council and district council vegetation clearance rules or any granted resource consent; b) identifying opportunities to undertake additional plantings of indigenous vegetation, and carrying out and managing any additional plantings in accordance with regional council guidelines for riparian planting;

Outcome Area	Objective	Targets
		c) undertaking farming activities in a manner that minimises adverse effects on existing indigenous vegetation and on any additional plantings of indigenous riparian vegetation; and d) managing pest plants in accordance with regional council rules
Ngai Tahu Values	Understand and respect Ngai Tahu values in relation to freshwater	• Actively support Wainono Lagoon restoration • Relationship with Waihao Runanga • Annual scheme meeting with Waihao Runanga • On-farm good management practices take into account Ngai Tahu values

4.1 MANAGEMENT ACTIONS FOR ACHIEVING THE OBJECTIVES AND TARGETS

4.1.1 Respecting Ngai Tahu Values in Relation to Freshwater

The schemes acknowledge that freshwater is a significant cultural resource for Ngai Tahu and understand that the health of the waterways and groundwater in the scheme areas is important for cultural values and interests, especially for the Waihao Runanga.

Some existing scheme activities that are improving management of both water quality and quantity will assist meet some of the Ngai Tahu objectives for freshwater. On farm requirements regarding Ngai Tahu values are incorporated into the relevant management areas in the scheme Farm Environment Plan template. The schemes also aim to improve overall understanding of Ngai Tahu customary rights and responsibilities and support tangata whenua to safeguard and enhance water for its taonga values for future generations.

Current activities that contribute to achieving Ngai Tahu objectives for fresh water include:

- Waihao River augmentation
- Wainono Lagoon restoration
- Avoiding over-allocation through setting limits for on-farm takes
- Supporting farmers to have farming activities at or above 'Good Management Practice'
- Requiring wetlands and riparian zones to be protected from inappropriate activities including stock access and cultivation
- Promoting on-farm practices that recognise the connection between land, groundwater, surface water and coastal waters
- Annual meeting with local Runanga

4.1.2 Irrigation Management

The schemes recognise that using water resources for irrigated farming is only one of many options for that water and, therefore, all water taken into the scheme must be used as effectively and efficiently as possible.

Scheme infrastructure and water distribution

The schemes will minimise losses in the off-farm distribution network through:

- A high standard of maintenance of the supply canals and secondary distribution system
- Use of scheme control and management systems, including buffer ponds, to supply water on demand and avoid operational by-wash. This includes receiving timely notification from farmers of their water requirements and use of all water requested.
- Regular monitoring and review of the volumes of water taken and distributed by the scheme to identify any water accounting issues, including flow gauging on MGI races.
- Continued investment in improvements to scheme infrastructure to improve supply efficiency.
- Piping the distribution network of the entire WDI scheme which minimises both losses and by-wash.
- The fish screen will be operated and maintained in accordance with the Fish Screen Management Plan (Appendix 8)[2].

Design and Installation Approvals

In order to ensure compliance with scheme infrastructure requirements and consent conditions including CRC091997 (5), CRC180558 (18) and CRC164369 (14), new systems must:

[2] CRC180558 (10)

- be designed and installed to meet the current Irrigation NZ Design and Installation codes of practice and standards
- take into account the specific requirements of any fragi-pallic soils on the property
- minimise and, wherever possible, avoid the application of irrigation water onto non-productive land, such as impermeable surfaces and river or stream margins
- meet scheme allocation and efficiency rules.

To ensure that new systems meet these requirements:

- Irrigation design information[3] must be submitted to MGI for review and a 'design approval'[4] received prior to the start of construction;
- Commissioning checks[5] must be carried out and results reported to MGI for review and approval.
- If the designer or installer is not certified by Irrigation NZ, then the schemes may arrange for a full independent check of the design or commissioning report at the irrigator's expense.
- For new areas of irrigation, no scheme water will be supplied until the design approval has been granted.

Water Supply

- On-farm irrigation efficiency[6] for new developments must be at least 80%.
- For all new MGI irrigation, the seasonal limit is up to 700 mm/year. In order to demonstrate irrigation is 80% efficient, users must be implementing soil moisture monitoring and applying this information to irrigation decision-making; and using no more than 600 mm in an average year and up to 700 mm only in a dry year.
- For WDI the seasonal limit, per property, is 627 mm/ha/year[7] of irrigated land.

Water measurement

- All spray irrigators are required to have water meters and telemetry, as specified[8].
- All borderdyke irrigators are required to return their hours, using either the database or phone app, at the completion of each watering.
- Users will have real-time access to their data and receive reports that benchmark water efficiency performance across the scheme (e.g. for different soil types, irrigation systems and land uses). If poor efficiencies are noted these will be reviewed.
- Water meters used for irrigation shall be maintained by the farmer and verified for accuracy within ±5%. The frequency of verification will be determined by manufacturer's recommendation.

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[3] See 'Getting Started' brochure and Irrigation Design Checklist (on www.mgiirrigation.co.nz)

[4] The relevant scheme will meet the cost of this design check, which is to ensure that the system meets all scheme requirements, including allocation limits and consent conditions, particularly for efficient water use.

[5] See www.mgiirrigation.co.nz for minimum requirements

[6] On-farm irrigation efficiency means the volume of water delivered and retained in the root zone after irrigation excluding soil moisture in excess of field capacity that rapidly drains away, divided by the volume of irrigation water delivered to the farm. On-farm irrigation efficiency includes losses from application non-uniformity and excessive application depths, surface run-off, surface redistribution and macro-pore flow, evaporation, and on-farm distribution. Surface run-off means irrigation water that flows over the surface to outside the area of irrigation.

[7] CRC180558 23

[8] See 'Getting Started' brochure and Irrigation Design Checklist (on www.mgiirrigation.co.nz)

Water Application

- All Water Users are required to use water as evenly and efficiently as possible by applying water at depths and frequencies to meet the needs of their crops while minimising runoff, ponding, and/or drainage to waterways or other properties, and losses to groundwater.
- Spray irrigators must demonstrate how they ensure that only the amount of water required is applied, including:
    - Daily soil moisture and soil temperature measurements, and
    - regular checks on irrigator operation (e.g. 'bucket test')
- Water Users are required to take all practicable steps to operate at good management practice and:
    - ensure that the volume of water used does not exceed that required for the soil to reach field capacity;
    - avoid leakage from pipes and structures;
    - minimise and, wherever possible, avoid applying water onto non-productive land, including tracks, impermeable surfaces (including roads) and river/stream margins
- Water Users are responsible for any irrigation water (and any associated contaminants) that leave their property boundary and for all costs incurred to remedy damages or prevent ongoing problems to downstream properties.
- Water Users who have either repeated or significant poor performance[9] in application or management of irrigation water will be required to complete formal training in irrigation operation.

Foothills catchments

If any proposed irrigation using MGI water is in any of the foothills catchments that are identified in CRC091997 condition 12 (MGI) as 'flowing water bodies'[10] (see Appendix 2), the water user must consult with MGI over the ecological surveys that are required **before and after** irrigation development.

Where condition 12 applies, the Water User must agree to carry out the relevant surveys, and must agree that if the ecological values are found to decrease as a result of irrigation, then:

- the Farm Environment Plan must be updated, within 3 months, to describe corrective actions to mitigate the decrease in ecological values and
- the actions must be implemented in the timeframe specified

Significant Wetlands

New areas of irrigation in the vicinity of any significant natural wetland[11] (as identified in the MGI database) must ensure that there is no reduction in area, no loss of significant areas of indigenous vegetation or significant habitats of indigenous fauna. Stock must be excluded.

Mudfish Sites (WDI)

Any potential mudfish sites on properties receiving water from WDI must be managed[12] so that cattle, deer and pigs are excluded, or an alternative habitat is provided, and mudfish relocated to that alternative habitat. Prior to commissioning, potential mudfish habitat within the command area was investigated, and 9 possible sites were surveyed in November 2015[13]. None

[9] For example, C or D grade audit results with required actions for irrigation or nutrient management
[10] Defined in CRC091997 condition 12
[11] Identified by MGI under CRC091997 condition 11. Contact MGI for further information.
[12] CRC180558 18 (f)
[13] Ryder Consulting Ltd: "Waihao Downs Irrigation Ltd. Pre-Commissioning Monitoring: Interim Report 2", July 2016 p32,

of these sites were considered ideal mudfish habitat, however they were sampled as they were the best of the available habitat in the area. No mudfish were found.

Before approving the FEP for any new areas of irrigation in WDI, the Environmental Manager will check for any additional potential sites for mudfish[14]. If any likely sites are identified, then a survey will be required. If mudfish are found, then protection will be required. No water can be supplied by the Scheme until this has been completed.

4.1.3 Nutrient Management

The objective and targets for nutrient management are based on regulations and industry good practice, which both require nutrient budgeting and management planning to understand and track Nitrogen and Phosphorus inputs and minimise losses.

Consent CRC164369, issued in August 2016, covers the discharge of nutrients to land for properties receiving water from Waihao Downs Irrigation scheme. The consent sets a total Nitrogen (N) load for WDI and the method for calculating this load.

Each property will have a 'Maximum Cap' for Nitrogen, which is the maximum Nitrogen loss rate for the farm based on soil type and area. Where there is more than one soil type, the Cap is calculated using the proportions of the different soil types. The consent[15] sets out the Maximum Caps at the time the consent was granted, and the method for calculating updated values when the *OVERSEER* model revised.

A new consent (CRC184153) for the discharge of nutrients to land that covers the MGI scheme area has been lodged in March 2018 and still has to be granted by Environment. The Maximum Caps do not apply to the Lower Waitaki (PC5) area of CRC184153 and so these farms are required to operate at or below the GMP Baseline Loss Rate.

All Water Users under the WDI resource consent are required to prepare and make available to MGI an annual year-end *OVERSEER FM* Nutrient budget[16] for each of the identified land management units and the overall farm, for the purposes of farm environment plan audits and consent compliance reporting to the regional council. The nutrient budget must be completed by a Certified Nutrient Management Advisor. Scheme water will not be provided unless the Nutrient Budget has been provided. Annual nutrient losses are reported to Canterbury Regional Council.

All Water Users are expected to:

- Carry out regular soil tests, appropriate to their land use
- Keep records of fertiliser applications and other inputs
- Apply fertiliser to Spreadmark[17] Code of Practice, either by a certified operator or with self-calibrated equipment
- Establish and maintain an Overseer FM account
- Provide MGI Irrigation with Administrator Access to their Overseer FM account

Fertiliser applications are expected to follow the relevant good management practices identified in the Code of Practice for Nutrient Management[18].

[14] CRC180558 condition 13g and CRC164369 condition 10e
[15] Schedule 2
[16] Or an alternative nutrient budget that is approved by Canterbury Regional Council
[17] http://fertqual.co.nz
[18] Code of Practice for Nutrient Management (with emphasis on fertiliser use) NZFRMA 2007

Farms that exceed the allowable nutrient losses when assessed under Good Management Practice (GMP) criteria will be required to prepare a Remedial Action Plan to reduce the loss rates. A Remedial Action Plan at the FEP level will be required in circumstances where the exceedance is demonstrated to adversely affect groundwater or surface water quality targets in the area.

When a nutrient 'hot-spot' is identified (through Overseer) this will be addressed through the farm environment plan and a Nutrient Management Plan will be prepared and implemented on the property.

Phosphorus and Sediment Losses: Critical Source Areas[19]

During the preparation or updating of the FEPs, the Environmental Manager/Advisor will identify areas that have a high risk for losses of Phosphorus (P) or sediment to waterways and record these as critical source areas (CSA). Suitable management practices are required as part of the FEP so that risks are reduced, and losses are minimised as far as is practicable.

A new programme to assist in the identification and management of CSAs has been set up through the Waihao Wainono Project which is a joint project between Morven Glenavy Irrigation Scheme and Environment Canterbury. A Memorandum of Understanding is in place to facilitate the on-farm and catchment scale work within the scope of this project.

Keeping Records

Under CRC180558 and CRC164369, WDI irrigators are required to supply the following records:

- Fertiliser use
- Stock numbers
- Land use

This information is included in the inputs for the *OVERSEER* nutrient budget model, so all water users are required to keep and maintain these records and provide annual updates, if requested.

4.1.4 Cultivation and Soil Structure

The schemes recognise the importance of good practice soil management on irrigated land to minimise losses to groundwater and surface water, particularly phosphorus, sediment, and faecal contamination.

The pallic type soils (e.g. Claremont and Ngapara) commonly found in the scheme command area are particularly susceptible to degradation of soil structure. Farm Environment Plans must identify appropriate management strategies for grazing and/or cropping that will be used to avoid, minimise or mitigate degradation of soil structure integrity, including:

- Preparation and implementation of a Winter Grazing Management Plan
- Comply with all regional council rules on winter grazing
- Winter grazing arrangements that avoid soil treading and compaction damage by stock on wet soils (e.g. feed pads, stand-off pads, on-off grazing, back fencing)
- Irrigation management (e.g. soil moisture monitoring, depth and timing of effluent irrigation) to ensure that drainage and overland flow are minimised
- Appropriate cultivation and other cropping practices to minimise soil loss and maintain healthy soils
- Appropriate planning and stock management when grazing scheme races

[19] CRC180558 (13p) and CRC164369 (10l)

4.1.5 Animal Effluent and Solid Animal Waste

Although individual properties are responsible for resource consents and other requirements for collected effluent, the schemes recognise that contamination of surface and ground water will occur with poor effluent management practices. Failure to comply with effluent requirements will be dealt with through the enforcement processes i.e. non-compliance with Farm Environment Plan and ECAN effluent requirements would put irrigation water at risk.

Water users will be required to demonstrate that they manage irrigation in effluent application areas carefully in order to minimise problems. This may include additional soil moisture monitoring in effluent blocks, and particular attention to effluent irrigation when designing new systems.

All farms that have an effluent discharge consent are required to complete an Effluent Warrant of Fitness every three years. This is undertaken by an independent certified Effluent Warrant of Fitness Assessor. Recommended actions from the assessment are included as part of the Farm Environment Plan required actions.

The schemes do not endorse flushing of effluent ponds with irrigation company water.

4.1.6 Scheme wide Ecological and Mahinga Kai Values

The schemes will actively seek opportunities to incorporate enhancement of ecological values in managing the open channels and other scheme infrastructure, in ways that do not conflict with scheme operation. The Environmental Management Fund (section 5.5) will assist in scheme-wide environmental management projects.

When the main distribution races are flowing, cattle, deer and pigs must be excluded. During periods when races are dry, they may be grazed at low stocking rates, sufficient to ensure that there is no visible damage to the races (pugging).

The schemes recognise that biodiversity is a critical aspect of environmental management. The schemes note that a priority outcome for the Canterbury Water Management Strategy (CWMS) is 'biodiversity protection' and the Zone Implementation Programme (ZIP)[20] outcomes include "*Coastal Streams have … biodiversity suitable for waterway*". The schemes will raise awareness of biodiversity issues and encourage on-farm actions and opportunities by linking and collaborating with agencies, organisations and networks with skills and experience to provide advice and support on-farm and across the scheme.

The schemes take a particular interest in two biodiversity projects within or adjacent to the scheme area which are identified in the ZIP:

- **Wainono Lagoon**, which is a wetland of national importance, and has been a significant mahinga kai resource for Tangata Whenua. The schemes recognise the importance of Wainono Lagoon and support its protection, enhancement and restoration.
- Mudfish habitat in the upper catchment of **Dog Kennel Stream**, one of the few remaining unaltered and natural streams with mudfish population in South Canterbury. The schemes support the ZIP aim to maintain mudfish populations by excluding stock and minimising the effect of nutrient runoff from the waterway, improving water quality and enhancing the natural riparian zone.

[20] ZIP ref ZIP Addendum South Coastal Canterbury 7/8/2014 version

On-farm

Before water is supplied to new areas of irrigation, the Environmental Manager/Advisor will ensure that suitable stock exclusion provisions are in place[21].

The schemes note that in order to design new irrigation systems that are highly efficient in terms of water and energy use it may be necessary to remove existing trees and shrubs. However, where shelter belts and other plantings are removed for irrigation development, MGI **encourages** replacement of these with suitable native vegetation plantings particularly in locations that assist to develop a network of native vegetation patches and corridors from the mountains to the sea.

'Sustainable Dairying: Water Accord'[22] will set a minimum standard for all dairy farms.

4.1.7 Targets for Continuous Environmental Improvement

The Company's policy and strategic priorities are to strive for continuous environmental improvement. This means that even if every farmer in the schemes was achieving an A grade in their FEP audit, the Company may choose to set and require higher objectives and targets to be achieved internally.

To ensure a consistent and top-down approach, the Board of Directors shall determine an annual environmental target or objective each August. This continuous improvement target shall be introduced and implemented through annual FEP reviews on a progressive basis; and it is expected that farms shall meet or exceed these targets within the specified timeframe.

[21] CRC180558 Condition 13g and CRC164369 Condition10e

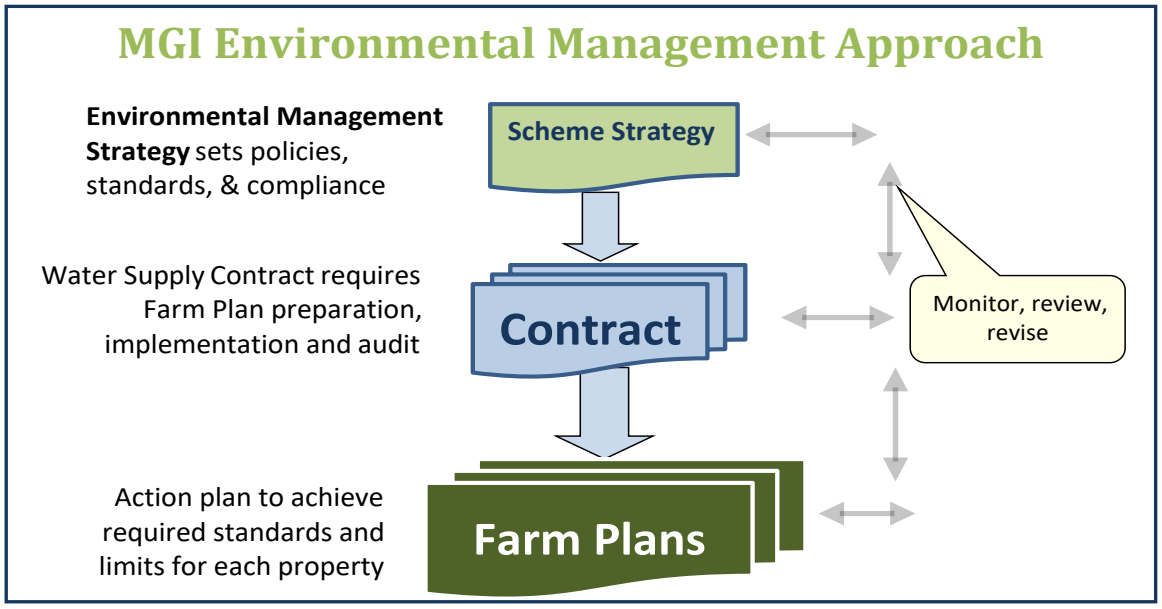
[22] "Sustainable Dairying: Water Accord A Commitment to New Zealand by the Dairy Sector" 2013 http://www.dairynz.co.nz/publications/dairy-industry/sustainable-dairying-water-accord/

5 Key Environmental Management Activities

5.1 Farm Environment Plans and Audits

Farm Environment Plans and the associated audits drive the process of continual environmental improvement for all properties receiving scheme water. The requirements for the Farm Environment Plan are part of the contractual arrangements between MGI/WDI and the user for supply of water (water use agreement). This agreement may also cover other environmental management obligations.

The diagram below shows the relationship between the Environmental Management Strategy, water use agreement and Farm Environment Plan, and the ongoing, inter-connected process of adaptive management through monitoring, review and revision.



All current water users have an approved Farm Environment Plan. For new scheme areas, a Farm Environment Plan must be completed and approved before water is supplied, including any land receiving water under a transfer arrangement, even if the transfer is temporary.

The schemes have a template for their FEPs (Appendix 3) that includes the matters required by their resource consent conditions, and also meets the ECAN LWRP schedule 7 requirements. The Environmental Manager/Advisor provides support and assistance in preparing the initial FEP and in reviewing and revising, as required. All MGI properties receiving water are required to have an FEP using the updated template prior to their next audit.

The MGI/WDI Operating Procedures for Farm Environment Plans set out details of the preparation, audit and updating processes.

Tangible and Measurable Targets

The Farm Environment Plan will establish, for each of its management areas:

- Measurable targets that clearly set a pathway and timeframe to achieve the objective;
- A description of good management practices and actions necessary to achieve the objective and targets;
- The records needed to demonstrate performance towards the targets.

5.2 Farm Environment Plan Approval and Audit Processes

Farm Environment Plans must be submitted to MGI for approval and signoff. When there are changes in ownership, management or farm system (e.g. conversion to dairy) the Farm Environment Plan must be reviewed in consultation with the Environmental Manager/Advisor, revised if necessary, then resubmitted for approval and audited in next audit round.

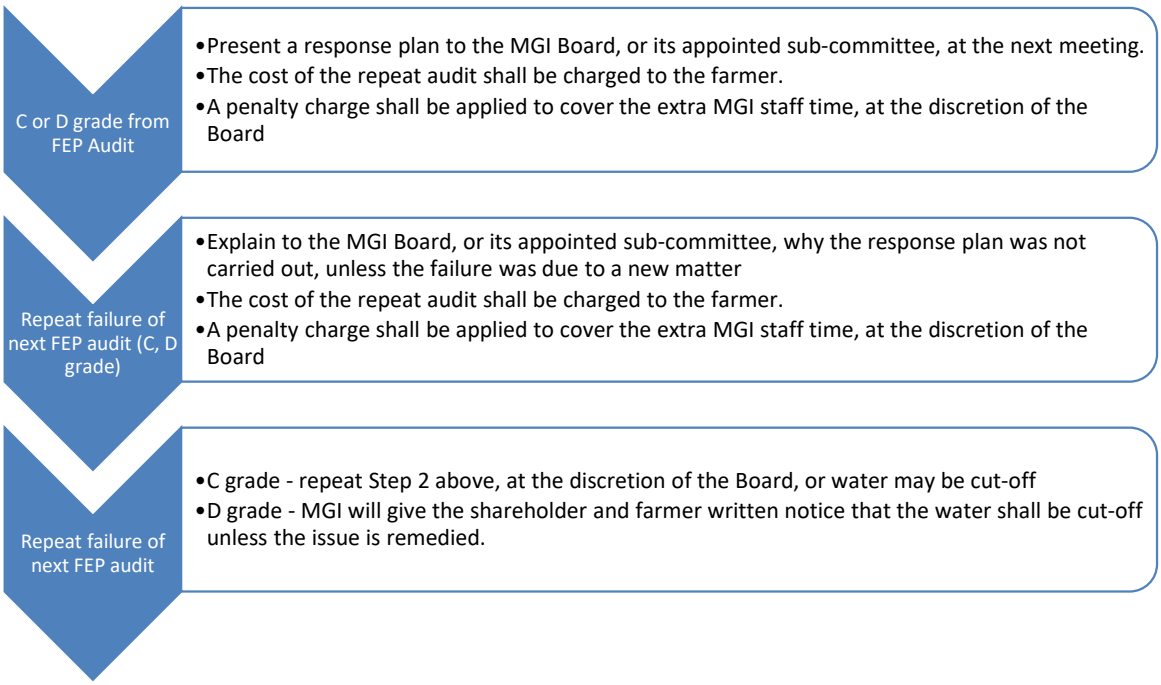
All Plans will be audited by an independent accredited auditor. For the first three years of receiving scheme water each Farm Environment Plan will be audited annually. Following each audit, the water user will receive an audit report that will include an overall grade (A - D) for the audit. The water users will be required to remedy any problems and complete actions required for improvement within the time frame specified. Failure to do this will invoke the enforcement procedures.

Following three years of full compliance for any property (all A or B grades), audits of that property may be reduced in frequency to at least once every three years. C and D grades will require re-audit as shown in Appendix 4.

Charges for additional audits

Policy 3.2.2 of the Company Policies document:

> Farmers are expected to carry out or demonstrate progress towards, improvement actions identified in the FEP, through an EWOF or arising from an FEP audit. If a farm fails an FEP audit then a response plan is required; and if the farm fails the repeat audit penalties shall apply. The costs of repeated audit failures shall not be borne by other shareholders. The following procedure shall apply:



Consultation on Results of FEP Audits

Following completion of the annual audits a summary of the results of all the audits and any general issues arising from the audits will be sent to all Water Users.

The Environmental Manager will offer to meet at least annually with the Waihao Wainono Community Catchment Group, which includes a range of community members with an interest in the area. The Environmental Manager will present the results of the WDI audits and other monitoring; and consult[23] with the parties.

The Environmental Manager will offer to meet with Te Rūnanga o Waihao at least annually to present the results of the FEP audits and other scheme monitoring; and to consult with Te Rūnanga o Waihao.

Farm Environment Plan Reporting

As required by the relevant consents each scheme will report annually to Canterbury Regional Council on FEP performance, including a summary of the results of the FEP audits for the preceding season, together with other environmental reporting (see section 7).

Review and Update of Farm Environment Plan Requirements and Template

The specific environmental management requirements for the Farm Environment Plans will be reviewed at least every five years, or if the conditions relating to the relevant RMA consents for the Scheme are changed by the Canterbury Regional Council.

Feedback from irrigators and others will be incorporated into any review of the FEP template. The initial draft of the FEP template was trialled with several scheme farmers, as case studies and changes made in response to farmer feedback. It is intended that the FEP Template meets all the scheme consent requirements, and is also approved by ECAN under LWRP Schedule 7, to meet the requirements for any individual farm consent. The current template which is in Appendix 3 has been approved by ECAN as meeting these requirements.

5.3 TRAINING AND INFORMATION PROVIDER

The schemes will continue to actively promote and facilitate an ongoing training and information programme to assist water users to improve farm performance, maximise environmental benefits and minimise adverse effects. The schemes are proactive in providing growers with information on recent research results and new technologies for best practice irrigated farming and support relevant research projects within the scheme area, where there are potential benefits to water users from the results.

The Irrigation Manager training course shall be offered at least once per year and is mandatory for all new managers that have not previously attended an Irrigation Manager Training course, within the previous five years. This course will also be compulsory for managers on farms that have been identified through the audit process as not achieving irrigation management objectives and targets. The requirement to attend irrigation Manager or any other training will also be at the discretion of the Environmental Manager.

Other training workshops will be provided as required where a specific requirement has been identified either through the FEP audit process or as part of the scheme's continuous improvement targets.

The schemes will use a mix of methods, including electronic and hard copy to communicate with water users. The web site will be regularly updated with the objective that it becomes recognised as the first point of call for scheme information.

[23] CRC180558 13f, 13k and CRC164369 10d, 10h

Where relevant, any ongoing education, training and information opportunities provided by the schemes will be extended to all properties within the command areas, and other properties in the Lower Waitaki catchment. This may include partnering with sector organisations (e.g. DairyNZ, FAR, Beef and Lamb), or promotion through irrigation and other networks (e.g. Lower Waitaki Collective, Irrigation NZ).

5.4 WAIHAO RIVER AUGMENTATION

The scheme provides water that augments flows in the lower Waihao River. This contributes significantly to supporting:

- Ecological sustainability in both the lower river and the Wainono Lagoon;
- Recreational opportunities in the lower river; and
- Groundwater recharge.

The schemes will continue to be actively involved in collaborative programmes for improved environmental management of the Wainono Lagoon.

6 Scheme Management Plan

6.1 FEP TEMPLATE

The Farm Environment Plan (FEP) template is provided in Appendix 3 of this document. The operational rules, FEP audit grades and compliance procedures are set out in the following sections.

The FEP Management checklist (Section 6.2) is designed for farmers so they can plan and track their key activities through the audit cycle.

6.2 FEP MANAGEMENT CHECKLIST

Timeframe	Task	Farmer Checklist
By December for MGI By September for WDI	Prepare an Overseer budget (actual) for previous 12-months[24]	
9-months before audit	Review previous FEP and ensure that all actions have been completed MGI will conduct a review and update of the FEP	
6-months before audit	EWOF for dairy farms with effluent management Address any EWOF actions arising[25]	
Prior to FEP audit	Prepare for the FEP audit visit Check that records are available to show auditor[26]	
FEP Audit	1) Address any FEP audit actions or recommendations arising. 2) For C or D grades, prepare a response plan for presentation to the MGI Board (Section 5.2)	
Repeat checklist cycle		

[24] Ensure that MGI administration has access rights to Overseer FM

[25] In some cases it may be sufficient to demonstrate progress on an action, such as an engineering design or contract, for actions that may require significant capital upgrade and investment

[26] Water usage and climate data can be downloaded from the MGI Database Property Page. Farms with soil moisture monitoring can obtain full dataset from the Loncel or Water Metrics cloud portals, or other service providers (if applicable).

6.3 WATER SHARING AND ALLOCATION AT LOW FLOWS

Consent CRC180558 (6) requires that the WDI EMS sets out how water takes during periods of low flow in the Lower Waitaki River will be shared among consented abstractors using a water sharing roster and how any reduced take from the Waitaki River at times of low flow will be shared among scheme water users.

Details for the flow sharing regime are still being developed with the Waitaki Irrigators Collective (WIC) but all shareholders will be afforded equal priority to a reduced quantity of water. The arrangements for low flow situations are outlined in Section 6.2 of this EMS.

6.1 FISH DEFLECTION BARRIER

The fish deflection barrier screen[27] is an engineered rock structure placed at an angle to the direction of flow that ensures that the entrance velocity of the water is sufficiently low to avoid fish entrainment and to promote fish migration away from the structure.

As the fish barrier is a passive rock structure, operational and maintenance requirements are minimal. Visual checks are carried out by the scheme operators every 1-2 days in accordance with the Fish Screen Management Plan (See Appendix 8), and maintenance scheduled when necessary.

Condition 10(i) requires inspection following high flows (> 600 m^3/s). These checks will be carried out as necessary, with due regard for health and safety risks while the river is at high flow.

6.2 OTHER WDI OPERATIONAL RULES AND REQUIREMENTS

WDI commenced operation in the 2016-17 season. Following a review of the first season's operation, the EMS has been updated to include other operational rules and requirements for the take of water, water management and water distribution. Any future updates to the operational rules and requirements will be included as required and/or when the EMS is reviewed.

6.3 ENVIRONMENTAL MANAGEMENT FUND

The Environmental Management Fund meets the requirements of CRC180558 and CRC164369 (WDI). Appendix 5 sets out the structure and operation of the Fund. This includes the priorities for the use of the fund[28]. The Application Form and Guidelines are available on the scheme web site.

Applications close on May 31st each year. The provisions for the management of this fund will be regularly reviewed and updated as part of the annual review of this EMS.

Funded projects must be maintained in perpetuity by the landowner responsible, and WDI/MGI will protect this through a condition of the FEP.

[27] CRC180558 10 and 12m
[28] CRC180558 (14) CRC164369 (10k)

6.4 PERFORMANCE INCENTIVES

MGI will offer awards and recognition to farmers that achieve high standards in their farm and environmental management. The purpose of the performance incentives is to encourage other farmers to strive for improved outcomes; and continuous environmental improvement.

Recognition may include financial incentives as well as non-financial acknowledgement such as signage and awards.

7 Compliance and Enforcement

7.1 PROCEDURES

The schemes will ensure that Water Users comply with the scheme requirements for take and use of water, including the Farm Environment Plan processes. Individual users who do not adhere to the requirements can put the consents for the whole scheme at risk. Established procedures will be used to deal with issues of possible non-compliance. Concerns about compliance can be raised at any time (e.g. by public, neighbour, scheme personnel), or as a result of the audit process.

The schemes will take an integrated approach to compliance and enforcement by:

- Promoting water user compliance

Using educational programmes, technical assistance, reduction in audit requirements for good performance and other methods to promote, support and encourage compliance by Water Users with sustainable irrigated land use requirements

- Implementing procedures to receive, record and respond to public complaints

The Environmental Complaints Procedure (Appendix 6) sets out the process to follow to record, follow up and respond to all public queries and complaints. Once a query is received it must be recorded on the appropriate form and reported to the General Manager and Environmental Manager within one business day. Contact numbers and emails are available on the web site, including a 24-hour duty operator contact that can be used for urgent reporting or emergencies. The web site Enquiry Form can also be used to report a complaint.

- Monitoring Water User compliance, including
    - Inspections and audits, both internal and independent;
    - Responding to complaints of non-compliance

- Responding to Water User non-compliance, including
    - Providing routine notice about a breach or alleged breach (e.g. phone call, warning letters, notice of violation, inspections) and a request to achieve compliance (for minor non-compliance with no or minor actual adverse environmental effect)
    - Entering discussions and providing advice to those who have significant non-compliance in order to develop a programme to achieve compliance
    - Action, where necessary (e.g. ongoing significant non-compliance or repeated minor non-compliance with moderate actual or potential adverse environmental effect):
        - To compel compliance;
        - To impose consequences for breaches (e.g. fines/charges, water restricted/cut off);
        - To correct damages
    - For major and/or persistent non-compliance, with serious or persistent actual adverse environmental effects, immediate request for compliance, advising that water supply will be ceased if problems are not remedied within 10 days.

- Imposing penalties that take into account:
    - Seriousness of the non-compliance;

- Degree of co-operation;
- History of non-compliance

- Compliance committee

The schemes will set up a compliance committee to deal with breaches that cannot be resolved through discussion and advice, or that may have incurred costs to the schemes or to others. This committee would have the power to:

- Impose a penalty charge upon a water user for breach of their agreement with MGI for supply of water;
- Convene a hearing so that disputes or issues can be presented;
- Restrict or cut off water

The committee would be appointed by the Board of MGI and have a membership of at least three, to ensure that the committee has a balanced representation that includes both farming and environmental management expertise.

The following actions will be taken where non-compliance with the FEP requirements is identified on a property receiving water from MGI or WDI[29]:

- For minor non-compliance with no or minor short-term actual adverse environmental effect, there will be routine personal contact with the water user, with follow-up written notification identifying the actions that must be taken and the timeframe to achieve compliance.
- For significant non-compliance, or repeated minor non-compliance, with moderate actual or potential adverse environmental effect, the Scheme will immediately contact the Water User and identify the actions that the water user must comply with immediately to meet the FEP requirements. The Water User will also be notified that water supply will be restricted if non-compliance is not remedied within 10 days.
- For major and/or persistent non-compliance with serious or persistent actual or potential adverse environmental effects, the Scheme will immediately contact the Water User and identify the actions that the Water User must comply with immediately to meet the FEP requirements. The water user will also be notified that water supply will cease if non-compliance is not remedied within 10 days.

The Guidelines for Achieving Environmental Compliance (Appendix 7) give examples of minor, significant and major non-compliance, as well as persistent or repeated non-compliance.

7.2 FLOW RESTRICTION PROCEDURE

Pursuant to the Schemes resource consents, once critical low flow conditions are reached in the Waitaki River at Kurow the rate of abstraction must be ramped down until the minimum flow is reached and then the total abstraction must be suspended. Agreement has been reached with the other Waitaki River irrigators and Meridian Energy to exercise flow sharing during these critical times.

Details for the flow sharing regime are still being developed with the Waitaki Irrigators Collective (WIC) but all shareholders will be afforded equal priority to a reduced quantity of water. Under the flow sharing agreement, the first step involves the convening of a Committee that includes representation from all the WIC members. The Committee considers the actual needs of each irrigating scheme or individual so that a fair flow sharing, and ramp-down allocation is identified on a case-by-case basis.

[29] CRC180558 Condition 13g and CRC164369 Condition10e

7.3 REMEDIAL ACTION PLAN

A remedial action plan (RAP) is a requirement of CRC184153, the MGI scheme nutrient discharge permit.

If a farmer exceeds their consent load[30], which has been determined for each FEP in Schedule 1 of CRC184153 or privately held Farming Land Use consents in some instances, then a RAP is required. The remedial action plan (RAP) shall set out the methods and timeframes for altering and/or adapting farm land use practices, including irrigation management practices, to ensure that the exceedance of the limit in Schedule 1 is returned as soon as practicable to the specified level for the relevant monitoring site.

The farmer shall prepare the Remedial Action Plan and identify the measures that they will implement to reduce the nutrient loss rate to within acceptable limits within an 12-month period of receiving the actual Overseer budget that identified the exceedance of the consent load. The timeframe for this RAP process is as follows:

- Prepare a RAP and submit to MGI within 2-months of the Overseer budget;
- The actions from the RAP shall be included with the FEP;
- The actions must be completed within 12-months of the exceedance and compliance confirmed by a new Overseer budget.

Failure to prepare a RAP or to address the actions arising shall be treated by MGI using the same procedure as an FEP Audit failure (C, D grade) at Step 2 (refer to Section 5.2).

[30] The "consent load" has been calculated for each FEP in Schedule One of the nutrient discharge permit. It is the Baseline GMP Loss Rate in PC5 areas and no greater than the Maximum Caps in the PC3 areas.

8 Monitoring and Reporting

8.1 Scheme Monitoring Plans

The Scheme Monitoring Plan for the MGI CRC184153 consent area is awaiting approval by the Regional Council. The Plan involves routine periodic water quality sampling of particular streams and wells for the purposes of checking compliance with receiving water limits and any trends in nutrient parameters.

The Scheme Monitoring Plan required under CRC180558 and CRC164369 (See Appendix 7) for the WDI area has been operating since the scheme completed commissioning in 2016.

The results from the Scheme Monitoring Plans are reported annually. The Environmental Manager is responsible for ensuring that the necessary monitoring, analysis, evaluation and reporting is undertaken by suitably qualified people.

8.2 Water Take Monitoring

The schemes have NIWA hydrological flow recorders and loggers operating on the intake gates to continuously monitor the volume and rate of water abstracted from the river. This data is telemetered in real-time to the scheme operators via the NIWA Sentinel control system.

The water takes from the Waitaki River are automatically recorded and continuously analysed to check that takes do not exceed the maximum permitted. In the event that any exceedance occurs, this will trigger an automatic alert to ensure that any problems are immediately rectified. WDI shares the MGI intake at Stonewall. The WDI share of the water is measured at several downstream flow recorders and from the levels in Baylyn Pond. Actual farm water use is also measured but there is a delay between farm use and the rate of abstraction due to water storage in Baylyn and Harrisons Pond.

For measured flows in the Waitaki River, the record from the Canterbury Regional Council's gauge at Kurow will be used.

8.3 Annual Reporting to Canterbury Regional Council

MGI

As required by consent CRC091977 and CRC184153, MGI will report annually to Canterbury Regional Council, including:

- Properties receiving irrigation water under this consent
- A summary of on-farm water supply for each year (July-June)
- A summary of the results of the Farm Management Plan audits for the preceding season, including:
    - Any issues of non-compliance with the Plans, the Strategy or the conditions of consent CRC091997;
    - Actions taken by MGI to remedy any non-compliance matters.

MGI also has other reporting requirements under other consents, including:

- Water takes
- Water quality associated with Waihao River augmentation

WDI Annual Environmental Report

As required by resource consents CRC180558 (29) and CRC164369 WDI will report annually to Canterbury Regional Council on environmental performance, including

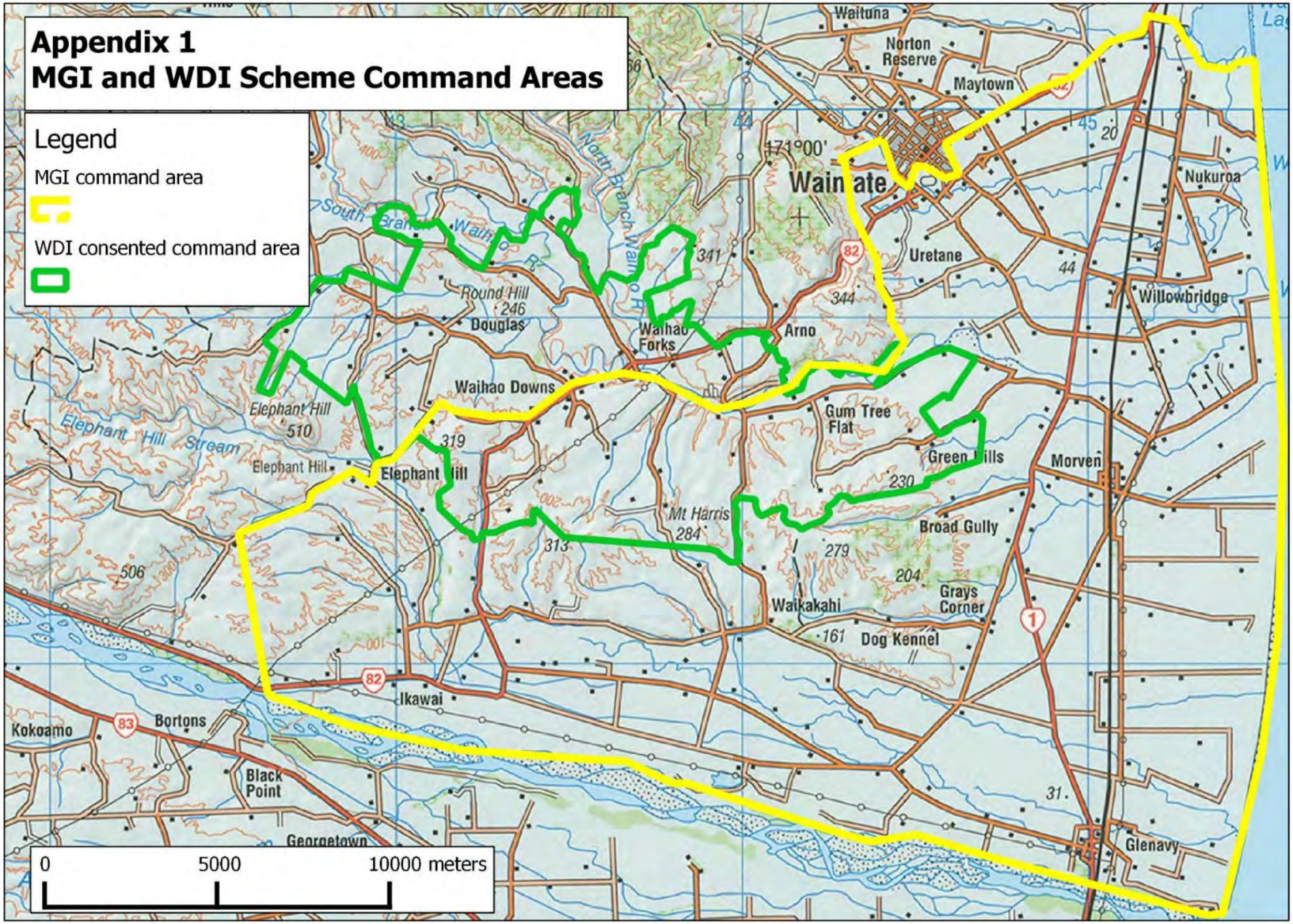
- Water takes, use and associated river flows
- Summary of the annual audit results for the FEPs
- Results of monitoring undertaken under the Scheme Monitoring Plan
- Analysis of differences in results from the previous report
- Proposed monitoring and off-farm environmental mitigation for next 12 months
- Analysis of, and response to, any unexpected adverse environmental effect from the exercise of CRC180558 in the last year
- Changes in those holding water supply agreements with WDI
- Provide any updates to Nutrient Discharge Allowance or Maximum Cap (e.g. if model changes)
- Provide schedule of properties, irrigated areas, soil types (by area), maximum cap
- Annual Nitrogen and Phosphorus losses for each property (from Overseer) for the current year (1 July to 30 June)
- Results of FEP audits, any significant non-compliance found, and actions taken by scheme and/or water user to remedy or mitigate the non-compliance.
- Results of the monitoring carried out under the WDI Environmental Monitoring Plan

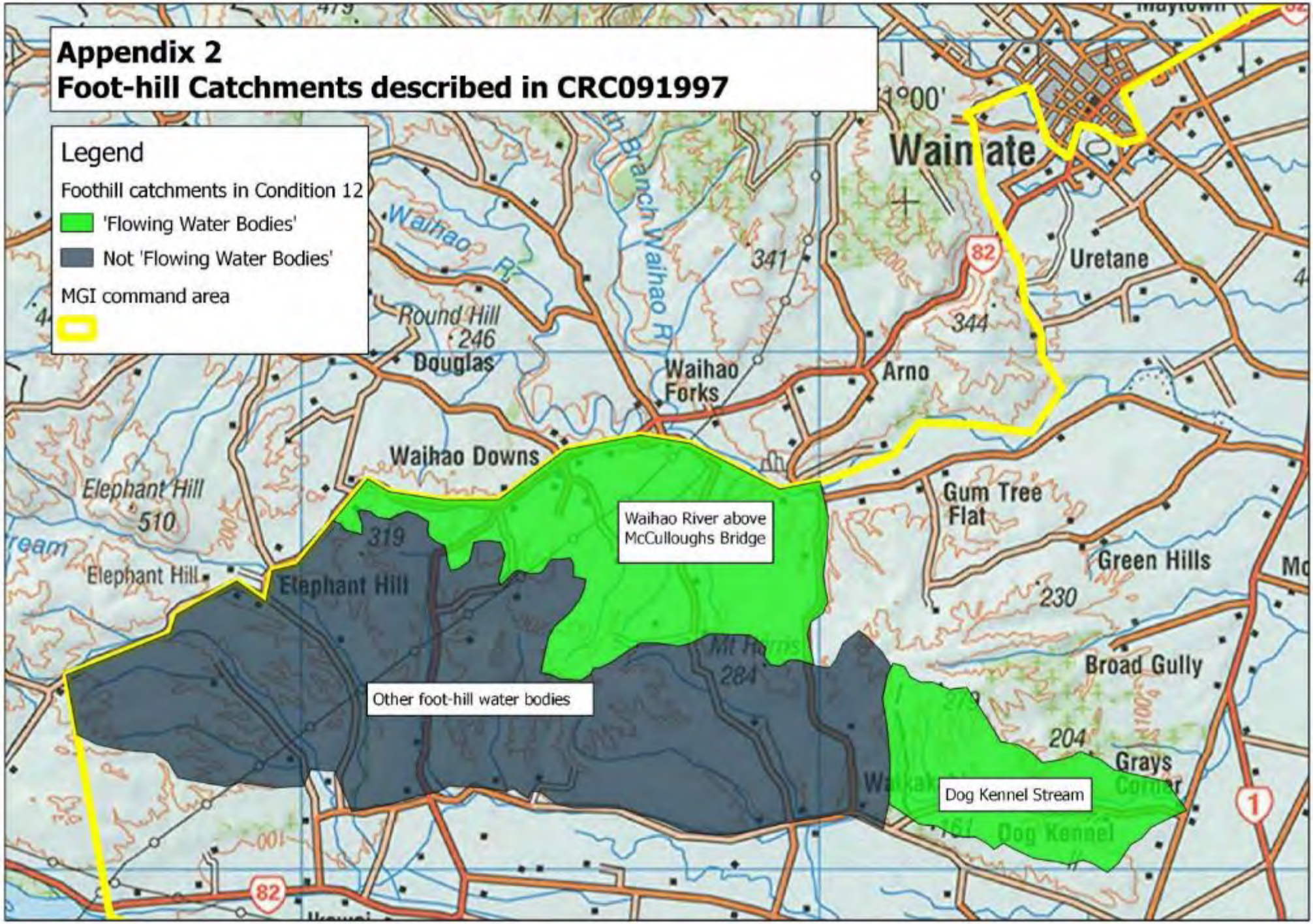
8.4 EMS REVIEWS AND UPDATES

This EMS will be reviewed annually for 5 years, following the commissioning of WDI scheme, then at least once every 3 years. The schemes will consult Canterbury Regional Council during the review process and will take into account the information gathered from any environmental monitoring carried out.

The revised EMS will be provided to Canterbury Regional Council as required under resource consents CRC091997, CRC180558 and CRC164369.

Once the reviews mandated by the resource consent have elapsed, MGI shall continue to review and where necessary update the EMS on an annual basis. The Board shall review and approve any updates by the July meeting each year.


Appendix 1
MGI and WDI Scheme Command Areas
Legend
MGI command area
WDI consented command area
Waituna
Norton Reserve
Maytown
171°00'
Waimate
Nukuroa
Uretane
Willowbridge
Arno
Waihao Forks
Douglas
Round Hill
246
Waihao Downs
Elephant Hill
510
Elephant Hill Stream
Elephant Hill
Gum Tree Flat
Morven
Mt Harris
284
Broad Gully
Waikakahi
Grays Corner
Dog Kennel
Ikawai
Bortons
Kokoamo
Black Point
Georgetown
Glenavy
0
5000
10000 meters


Appendix 2
Foot-hill Catchments described in CRC091997
Legend
Foothill catchments in Condition 12
'Flowing Water Bodies'
Not 'Flowing Water Bodies'
MGI command area
Waihao R.
Round Hill
246
Douglas
Waihao Forks
Arno
Uretane
Waihao Downs
Elephant Hill
510
Elephant Hill
Elephant Hill
319
Gum Tree Flat
Green Hills
230
Broad Gully
204
Grays
Waihao River above McCulloughs Bridge
Other foot-hill water bodies
Dog Kennel Stream
341
344
284
82
1

Volume Two – Other Appendices

Appendix 3: Farm Environment Plan Template

Appendix 4: Farm Environment Plan Audit Grades

Determining Overall Audit Grade

Management Area Results	Audit Grade	Next Audit within
'HIGH' for ALL Management Areas	A	3 years
1 or more 'MEDIUM' results, no 'LOW' & on-track to achieve objectives	B	2 years
1 or more 'MEDIUM' results, no 'LOW' & NOT on-track to achieve objectives	C	1 year
One or more 'LOW' results	D	6 months

Farm Plans will be audited annually, until there have been 3 consecutive 'A' or 'B' results, then they will be audited at least once every 3 years.

C or D grades

Following an audit grade of C or D:

- The Scheme Environmental Manager will Review the FEP and required actions with the Plan Implementer, and develop an action plan if appropriate.
- Policy 3.2.2 of the Company Policies shall apply

Audit requirements for changes on a property

If there is:

- a change in owner, manager or land use change (e.g. dairy conversion) or
- a significant increase in irrigated area (>10%) or change in irrigation system

The property will be audited at the next audit round following the change.

The overall grade for that audit will determine the timing of the next audit, unless the property has not yet achieved a total of 3 consecutive 'A' or 'B' results.

Appendix 5: Environmental Management Fund

WAIHAO DOWNS ENVIRONMENT MANAGEMENT FUND

Date of Policy: 29 January 2016

PURPOSE

Condition 13 o) l) ii) of the Waihao Downs resource consent CRC040428 CRC164368 to take water from the Waitaki River[1] specifies that the consent holder must establish and administer a Scheme Environment Management Fund. This policy document sets out the framework for MGI's management of the Fund.

The Scheme Environmental Management Fund is to be used by the consent holder to fund, firstly, environmental mitigation required as a result of the effects of the operation of the irrigation Scheme which is not otherwise required by the individual Farm Management Plan or specific consent conditions and, secondly, other environmental management projects within the area affected by the operation of the Scheme.

PROCEDURE FOR APPLICATIONS TO THE FUND

- Applications for funding shall close by the 31st day of May each calendar year (beginning May 2017).
- Applications must be made using the prescribed form and must comply with the funding criteria below:

FUNDING CRITERIA

Priority, for the distribution and use of the Fund shall be provided to environmental mitigation projects that are not otherwise required by the individual Farm Management Plans or specific consent conditions. Applications for funding shall be for the following types of projects:

a. Physical protection of, stock exclusion from, and indigenous vegetation planting along riparian margins of rivers and streams;

b. Wetland enhancement and wetland creation, including the development of wetlands along intermittent streams;

c. Permanent protection of wetland areas that could contain mudfish.

d. Reduction or mitigation of hill country erosion and sediment runoff, provided that the intended use of the land involved is not for agricultural purposes.

[1] Also Condition 10j of CRC164369 (Nutrient Discharge)

Appendix 6: Procedure for Environmental Complaints Management

Version: 1
Date: June 2017
Author: Claire Mulcock
Resource consents: CRC164368 and CRC164369 (WDI)

Complaints received from the general public or other shareholders are an important mechanism for identifying and addressing environmental issues. All complaints will be recorded and dealt with through the complaints management process below. In some cases a complaint may be made directly to Canterbury Regional Council and the schemes notified either by CRC or the complainant.

1. When a complaint is received, the details will be recorded on the Complaint Log Form (attached), and the form sent to Scheme Administrator who will maintain a register of complaints.
2. The Scheme Administrator will ensure that both the General Manager and the Environmental Manager are notified as soon as possible about a complaint, and responsibility for action passed to the Environmental Manager, or another appropriate person.
3. The person responsible (the "Responder") will contact the complainant within 1 working day and arrange a time to view the problem with the complainant.
4. If the problem is related to an on-farm issue, the Responder will view the problem on-site, identify the source of the problem and discuss the problem with the relevant water user.
5. If the complaint is deemed to be a legitimate environmental issue, then the Environmental Manager will work with the water user to develop an Action Plan to address the problems identified. The Action Plan will include target timeframes for actions to be undertaken by the water user.
6. The Responder will contact the complainant and inform them of the actions being implemented to address their concerns.
7. If the complaint is identified as a legitimate environmental issue and the water user(s) at fault do not engage in the process to address the problems or do not implement the actions required, the enforcement procedures set out in the Environmental Management Strategy will be invoked.
8. If multiple complaints are made against a water user in a six-month period, the enforcement process may be accelerated.
9. The Scheme Administrator will retain records for each complaint, including Complaint Form, Action Plan and all correspondence.

Complaint Management – Target Time Frames

Target Time Frame	Action	Notes
1 working day	Complainant contacted for further information and to arrange site visit	
20 working days from site visit	Action Plan prepared	Advice may be required from other parties, including Environment Canterbury, which may cause delays
20 working days from site visit	Complainant contacted with an update on actions being taken	
3 months	Issue Resolved	

Environmental Complaint Log Form

When a complaint is received by MGI/WDI employee or other representative, the complaint must be recorded on this form, and it must be reported to the **General Manager and Environmental Manager within one business day.**

Complaint number:

Date received:

Details of Person making complaint
Name
Address
Phone
Email

Complaint taken by
Name
Date
Received as Phone call / email / in person / web site message / other
Reported to

General Description of the activity subject to complaint:
Location of Activity:
Name of Operator (if known):
Date(s) of alleged breach:
Description of the activity (what is the problem?)

Is there any photographic or other physical evidence?
(Describe and/or attach)

Response from Scheme

List of Action Items and Responsibility

Appendix 7: Guidelines for achieving environmental compliance by water users

Version: 1
Date: June 2017
Author: Claire Mulcock
Resource consents: CRC164368 and CRC164369 (WDI)

Water users need to ensure they know the rules and follow them. Repeated or persistent non-compliance by water users puts the scheme's resource consents at risk and can create poor public perception of both irrigation schemes and irrigating farmers.
Although most people and businesses are willing to comply, the schemes recognise that barriers such as a lack of awareness or understanding that may prevent some people from achieving compliance. Some may comply reluctantly, and others will not comply at all. A key focus is to remove barriers to compliance and use a range of different tools to educate, help, encourage and require compliance. Scheme responses can range from encouraging and assisting an individual or business to achieve compliance, to revoking rights to water in cases of serious risk and deliberate and/or persistent non-compliance.
Facilitating and encouraging compliance is the preferred approach. There are occasions when this is not the best option. The particular circumstances of the case and the problems identified are considered. The following factors guide the choice about the compliance tools used in each particular case:

- seriousness of the actual or potential adverse environmental effects
- the extent of damage or risk of damage
- the public interest
- fairness
- the conduct and compliance history of the person or business
- attitude to compliance – the general attitude (or level of willingness) of the person or business to be compliant.
- implications for scheme environmental performance, including resource consent compliance

On receiving any report of environmental non-compliance by a water user (e.g. FEP audit report or a verified complaint) an immediate assessment will be undertaken of the seriousness of the adverse effects and any need for urgency in addressing these effects. Where there are significant adverse effects, a priority would be given to avoiding, remedying or mitigating those effects. Non-compliance will be categorised as minor, significant or major. Both the attitude to compliance and the level of risk will determine the compliance response. The range of options available to the Scheme for achieving compliance include:

- Permanent loss of rights to water supply
- Temporary loss of rights to water supply
- Ongoing inspection and monitoring at users cost
- Assistance to achieve compliance
- Support (information, training etc) to avoid non-compliance situation arising

Mitigating actions such as a rapid response to satisfactorily resolve an issue before actual serious adverse environmental effects occur will be taken into account. In cases of

imminent, serious and/or irreversible environmental harm, it may be necessary for the scheme to resort to immediate action to carry out the required work or repairs. Under the provisions of the Water Supply Agreement (e.g. clause 19.3 in draft version on web site 2/06/17), if such urgent action is required, the Scheme is not obliged to give the water user any notice before it carries out the required work or repairs.

The following tables outline the non-compliance categories[31] and give examples of the types of issues that would be defined as minor, significant, major or repeated non-compliances. The examples are guidelines only. As each situation is different, every incident will be considered on a case by case basis. It is not possible to identify and predetermine the action(s) suitable for all possible scenarios that may arise.

Category 1: Minor non-compliance	No, or minor, actual adverse effects	While a minor non-compliance needs to be addressed, the time frame for compliance is not generally considered urgent. Routine personal contact with water user by EM, with follow-up written notification of the actions and timeframe for achieving compliance
Category 2: Significant non-compliance; or Repeated minor non-compliance	Moderate actual or potential adverse effects	Immediate action is required to address a significant non-compliance. The water user will be requested to comply within a given timeframe (period dependent upon actual or potential environmental effect and the response required). Water supply will be restricted if compliance has not occurred within 10 days of due date. Immediate action by EM, requiring immediate compliance by the water user. Notification that water supply will be restricted if the non-compliance is not remedied within 10 days.
Category 3: Major non-compliance; and/or Persistent non-compliance	Serious or persistent actual adverse environmental effects	The water user will be requested to address a major non-compliance urgently and within a specified timeframe (period dependent upon actual or potential environmental effect and the response required). Water supply will be ceased if compliance has not occurred within 10 days of due date. Immediate action by EM, requiring immediate compliance by the water user. Notification that water supply will cease in 10 days if the non-compliance is not remedied.

[31] CRC164368 and CRC164369 (WDI)

Examples of Minor, Significant and Major Non-Compliance

These examples are guidelines only. As each situation is different, incidents will be considered on a case by case basis.

Minor non-compliance No, or minor, actual adverse effects	- Breaches of maximum caps - Failure to supply compliance records (effluent consent compliance report; nutrient budget) - Failure to complete routine monitoring and provide results e.g. bucket tests, soil moisture monitoring - One-off temporary failure to exclude stock from waterways, with no, or minor, damage to waterway - One-off short-term runoff to road or neighbour - Minor ponding of effluent - Minor exceedance of allocated water take - Obvious signs of over watering – runoff, wetness in gullies, etc. - Obvious signs of leaks from pipes and structures - Inconsistencies evident in nutrient budget - Effluent storage and/or discharge systems not maintained - Riparian margins of insufficient width to act as a reasonable filter for nutrients, pathogens etc. - One or more public complaints received by the scheme in one year for the same verified non-compliance with minor actual adverse effects
Significant non-compliance or repeated minor non-compliance Moderate actual or potential adverse effects	- Repeated failure to exclude stock from waterways, with minor or moderate damage to waterway - Insufficient effluent storage for size and nature of operation - Evidence that effluent applied at rates which exceed ability of soil to assimilate it. - Stock crossings inadequate to prevent effluent / run-off reaching waterways. - Significant irrigation induced erosion problems with little or no corrective action - Significant erosion problems due to cultivation practices used on property - Persistent runoff to road or neighbour - Repeated failure to complete monitoring and provide results (unable to demonstrate appropriate water use) - Required audit action not achieved by time of subsequent audit (unless significant progress demonstrated) - Two or more public complaints received by the scheme in one year for the same verified non-compliance with minor or moderate actual or potential adverse effects.
Major non-compliance Serious or persistent actual adverse environmental effects	- Effluent storage and/or disposal infrastructure and/or practices that do not meet current ECAN rules or the property's effluent discharge consent. - Ongoing failure to exclude stock from waterways causing damage to waterway. - Repeated or ongoing minor or significant non-compliances. - One or more public complaints received by the scheme in a year for the same verified non-compliance with serious or persistent adverse effects.

Appendix 8: Fish Screen Management Plan

Version: *1*
Date: *May 2017*
Author: *Craig Evans*

Consent:	CRC164368 to take water for Waihao Downs
Location of Fish Screen:	Stonewall Intake, Waitaki River near NZMS260 J41:408-897

Introduction

Morven Glenavy Ikawai Irrigation Company Limited is the owner and operator of Waihao Downs Irrigation Limited. The combined water intake at Stonewall (CRC000897 and CRC164368) includes a fish screen which was constructed in 2014-15 in conjunction with the construction of the Waihao Downs Irrigation Scheme.

The fish screen is fully constructed and commissioned, and its first full season of operation occurred from 1 September 2016 to April 2017.

Condition 10b) of CRC164368 requires that the fish screen is operated and maintained in accordance with the design.

Condition 10i) of CRC164368 requires that the fish screen is inspected for any damage or fish entrainment within a 24-hour period of a high river flow event, either 600 m^3/s or 450 m^3/s as measured at Kurow.

Condition 12m) of CRC164368 requires that the Scheme Management Plan includes how the fish screen will be operated and maintained.

Fish Screen Operation

The fish screen is an engineered structure comprising rocks of a particular size and roughness installed at an angle to the direction of flow that ensures that the entrance velocity of the water is sufficiently low to avoid fish entrainment and to promote fish to migrate away from the structure. Given that the fish screen is a passive rock structure there are no particular operating requirements other than flowing water passed the screen and providing maintenance oversight.

Fish Screen Maintenance

The fish screen is a low maintenance rock structure and so maintenance is for the most part reactive and based on visual inspections. It is not always possible to inspect the fish screen because the ability to check it is dependent on the flow conditions of the Waitaki River.

The scheme operators visit the intake every 1 or 2 days on average and check the gates, infrastructure and fish screen. For the fish screen this is a visual inspection of:

- Whether there is any visible sign of damage to the structure, such as displaced rocks or entrained detritus like sediment, branches, trees etc that might disrupt the entrance velocities to the screen;
- Whether the flow of water passed the screen is laminar or turbulent;
- Where didymo mats are passing by, whether they flow passed the screen or become entrained;
- Whether fish are visible on the canal side of the screen.

It is not always possible to comply with Condition 10i) and inspect the fish screen within 24-hours of a high river flow unless the river flow has dropped enough to facilitate the

inspection. MGI will not conduct an inspection if river flow conditions deem the activity as hazardous to the health and safety of the Operators.
If maintenance is required, then it must be scheduled in accordance with the prevailing river flow for health and safety reasons. If the maintenance activity can be performed by hand, then the operator restore loose rocks or remove branches etc on an as-required basis, otherwise it will be performed using an excavator.
To date there have been no problems with didymo entrainment. Didymo mats appear to be passing right by the fish screen and continuing downstream of the weir. If it is found that the fish screen becomes blocked by didymo then a new maintenance procedure will have to be developed. It may be trial and error to determine a successful methodology but MGI has given consideration to:

- Air or water jetting – using compressed air or water to jet the fish screen to dislodge and eject entrained material;
- Reconstruction – partly dismantle the fish screen to physically remove entrained material and then reassemble it again.

The maintenance check-list for use by the Operators follows:

Maintenance Checklist – Fish Screen

Date of Inspection:	
Inspection By:	
River Flow (measured at Kurow):	

Observation Checklist

Is there any visible signs of damage to the fish screen structure?	
Is there any evidence that the screen might be blocked?	
Is the river flowing passed the screen in an efficient manner?	
If present, is didymo flowing passed the fish screen?	
Are fish visible on the other side of the screen?	

Maintenance Actions Required

Describe any actions identified (if any):

A digital photo is recommended to document the inspection on the GIS (GeoPhone).

Appendix 9:
Waihao Downs Environmental Monitoring Plan

Appendix 10: MGI Scheme Monitoring Plan