

*Tabled at Hearing 08/05/2013*

## **RESOURCE CONSENT CRC071029**

*Pursuant to Section 104 of the Resource Management Act 1991*

**The Canterbury Regional Council (known as Environment Canterbury)**

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**GRANTS TO:** The South Canterbury Irrigation Trust & Meridian Energy Limited

**A WATER PERMIT:** To take and use water from the Lower Waitaki River.

**COMMENCEMENT DATE:** 17 November 2011

**EXPIRY DATE:** 27 April 2045

**LOCATION:** Waimate Kurow Road, HUNTER DOWNS IRRIGATION SCHEME

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### **SUBJECT TO THE FOLLOWING CONDITIONS:**

#### **GENERAL**

- 1) The water shall be taken from the Lower Waitaki River at or about map reference NZMS 260 J40: 3610-9075.
- 2) The water shall be used for the irrigation of land within the Scheme Area generally in accordance with the attached plan entitled "Hunter Downs Irrigation – Scheme Area", and ancillary purposes associated with the operation of the Hunter Downs Irrigation Scheme.
- 3) The take and use of water permitted by this consent shall not be exercised until resource consents have been obtained for the construction and land use of an intake, a diversion channel and an irrigation delivery system; and for the diversion (if necessary) and discharge of the water necessary for the operation of the Hunter Downs Irrigation Scheme.

#### **RATE OF TAKE OF WATER**

- 4) The rate at which water is taken from the Lower Waitaki River shall not exceed a maximum rate of 20.5 cubic metres per second, with a volume not exceeding 251 million cubic metres between 1st July and the following 30th June.
- 5) The rate at which water is taken from the Lower Waitaki River shall not exceed a maximum rate of 17.5 cubic metres per second, with a volume not exceeding 213 million cubic metres per year between 1st July and the following 30th June, when consent CRC040428 (Waihao Downs Irrigation Limited) or any subsequent replacement consent is being exercised.
- 6) For the purposes of determining compliance with Conditions 4 and 5:
  - (a) The instantaneous rate of water take (in cubic metres per second) shall be recorded at least every 15 minutes;
  - (b) The average rate of water take (in cubic metres per second) over the previous 1-hour shall be recorded at least every 60 minutes, based on the above 15 minute instantaneous record;
  - (c) In the event that any instantaneous rate of water take (under a. above) exceeds the maximum rates of water taken in Conditions 4 and 5, then the consent holder shall ensure that the subsequent 1-hour average starting with that 15 minute period does comply with the maximum rates of water take in Conditions 4 and 5. This shall be deemed to constitute compliance with Conditions 4 and 5.

Notwithstanding c. above, any instantaneous recorded rate of water take (under a. above) shall not be more than 10% greater than the maximum rates of water take specified in Conditions 4 and 5.

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# CESSATION AND RESTRICTION OF WATER TAKE

- 7) Whenever the flow in the Lower Waitaki River falls below 175.5 cubic metres per second, as estimated by the Canterbury Regional Council based on the daily mean flow for the previous day at the Kurow recorder site map reference NZMS 260 140:079:088: then the rate at which water is taken from the Lower Waitaki River shall not exceed the rate determined in accordance with either Condition 7(a), 7(b) or 7(c) below.
- (a) when consent CRC040428 (Waihao Downs Irrigation Limited) or any subsequent replacement consent is not being exercised

Waitaki River Flow (cumecs)	Allowable Abstraction Rate (cubic metres per Second)
175.5	20.5
173.2	18.45
170.8	16.4
168.5	14.35
166.1	12.3
163.8	10.25
161.4	8.2
159.1	6.15
156.7	4.1
154.4	2.05
152	0.0

- (i) When the flow falls below 152 cubic metres per second, the taking of water in terms of this permit shall cease.
- (b) when consent CRC040428 (Waihao Downs Irrigation Limited) or any subsequent replacement consent is being exercised

Waitaki River Flow (cumecs)	Allowable Abstraction Rate (cubic metres per Second)
175.5	17.5
173.2	15.75
170.8	14.0
168.5	12.25
166.1	10.5
163.8	8.75
161.4	7.0
159.1	5.25
156.7	3.5
154.4	1.75
152	0.0

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- (i) When the flow falls below 152 cubic metres per second, the taking of water in terms of this permit shall cease.
  - (c) The rate at which water is taken from the Lower Waitaki River shall not exceed that specified in a water sharing roster determined as follows:
    - (i) The water sharing roster has been prepared by all those consent holders who are sharing water in terms of this roster that shall include the holder of this consent and any one or more holders of other consents to take water or divert from the main stem of the Lower Waitaki River (hereafter referred to as the Water Sharing Group);
    - (ii) The water sharing roster specifies the consent holders in the Water Sharing Group to which the roster applies;
    - (iii) The water sharing roster specifies the period for the which the water sharing arrangements in the roster apply;
    - (iv) The water sharing roster specifies the proportion of flows available for taking by each member of the Water Sharing Group when the flow in the Lower Waitaki River at the Kurow Gauge is greater than 152 cubic metres per second;
    - (v) The water sharing roster ensures that:
      - the rate of water taken by any consent holder in the Water Sharing Group will not exceed the requirements of their resource consent, and
      - the combined rate of the water takes by all members of the Water Sharing Group would not exceed the combined rate of the water takes available to all those consent holders, as calculated in terms of the formula in Conditions 7(a) or (b).
    - (vi) The water sharing roster has been provided to the Canterbury Regional Council no less than 10 working days before it is implemented in terms of Condition 7(c).
- 8) For the purposes of determining compliance with Condition 7:
- (a) The flow in the Lower Waitaki River shall be the calculated 24 hour average flow, measured and recorded at least every 15 minutes at, or in the immediate vicinity of, the Kurow Gauge<sup>1</sup> (Kurow Gauge flow map ref: I40:079-088), and then calculated and recorded every 60 minutes as the average of the flows measured and recorded over the previous 24 hours;
  - (b) The flow in the Lower Waitaki River at the Kurow Gauge shall include any flow taken from the Waitaki catchment upstream of the Kurow Gauge and returned downstream of the Kurow Gauge but upstream of the Hunter Downs Irrigation Scheme point of take;
  - (c) Any flow measuring and recording device for the purposes of Condition 8(a), which is not the Canterbury Regional Council's Kurow Gauge, shall be available for inspection at all times by the Canterbury Regional Council; and
  - (d) All data from the measuring and recording device and all calculated and recorded flows, in accordance with Condition 8(a) above, shall be provided to the Canterbury Regional Council on request and shall be accessible and available for downloading at all times by the Canterbury Regional Council.
- 9) For the purposes of determining compliance with Condition 7:
- (a) The flow in the Lower Waitaki River shall be the calculated 24 hour average flow, measured and recorded at least every 15 minutes at, or in the immediate vicinity of, the Kurow Gauge (Kurow Gauge flow map ref: I40:079-088), and then calculated and recorded every 60 minutes as the average of the flows measured and recorded over the previous 24 hours;
  - (b) The flow in the Lower Waitaki River at the Kurow Gauge shall include any flow taken from the Lower Waitaki catchment upstream of the Kurow Gauge and returned downstream of the Kurow Gauge but upstream of the Hunter Downs Irrigation Scheme point of take;
  - (c) Any flow measuring and recording device for the purposes of Condition 8(a), which is not the Canterbury Regional Council's Kurow Gauge, shall be available for inspection at all times by the Canterbury Regional Council; and

<sup>1</sup> Canterbury Regional Council water level recording site number 71104

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- (d) All data from the measuring and recording device and all calculated and recorded flows, in accordance with Condition 8(a) above, shall be provided to the Canterbury Regional Council on request and shall be accessible and available for downloading at all times by the Canterbury Regional Council.

#### TIMEFRAME FOR EXERCISE OF TAKE OF WATER

- 10) The take permitted by this consent shall not be exercised during the period from 1 May until 31 August in each year, other than water required for maintenance and testing purposes. The consent holder will give 48 hours prior written notice to the Canterbury Regional Council before commencing such temporary use.

#### WATER METERING FOR TAKE OF WATER

- 11) (a) Prior to water being taken under this consent, the consent holder shall install a water flow measuring device that has an International accreditation, New Zealand or equivalent calibration endorsement, to continuously measure the taking of water in terms of this consent to within an accuracy of plus or minus 10 percent.
- (b) The measuring device shall, as far as is practicable, be installed at a site likely to retain a stable rating, i.e. a man-made channel, concrete, steel or fibreglass flume or pipe. Installation shall be in accordance with ISO 1100/1-1981 or equivalent by a suitably qualified or experienced person.
- (c) The rates and times of abstraction shall be recorded by electronic means, at not greater than fifteen minute intervals, with a tamper-proof recording device such as a data-logger kept for that purpose. The recorded data shall not be changed or deleted by any person, until after twelve months have passed since the date of recording.
- (d) The measuring and recording device shall be available for inspection at all times by the Canterbury Regional Council.
- (e) All data from the recording device described in Condition 11(a) shall be provided to the Canterbury Regional Council on request, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.
- (f) Within six months of the commencement of this consent, and at five-yearly intervals thereafter, and at any other time when requested by Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council signed by a suitably qualified person certifying the accuracy of the measuring and recording devices installed in accordance with Conditions 11(a) and 11(b), and also certifying that data can be readily accessed.

#### FISH DEFLECTION BARRIER / FISH SCREEN

- 12) (a) Prior to the taking of water pursuant to this consent, the consent holder shall install, operate and maintain a fish screen ("the screen") or deflection barrier across the intake designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 12(f).
- (b) The screen or deflection barrier shall as far as practicable prevent the entrainment, impingement and entrapment of salmonids including adults, fingerlings and fry and for the purposes of this condition this shall be achieved by installing, operating and maintaining a fish screen or deflection barrier in accordance with the certified design plans referred to in Condition 12(c).
- (c) The design plans for the screen or deflection barrier shall be certified by: a suitably qualified engineer with experience in the design and operation of fish screens and deflection barriers; and either a fisheries biologist with post-graduate qualifications in salmonid fisheries or a fisheries biologist with internationally recognised experience in salmonid fisheries research ("the Certifiers").
- (d) The appointment of the Certifiers by the consent holder shall be subject to the prior written approval of the person duly authorised by the Canterbury Regional Council.

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- (e) Prior to the commencement of construction of the fish screen or deflection barrier, the consent holder shall provide to the Canterbury Regional Council:
  - (i) The certified design plans including the screen or deflection barrier slot/aperture size, sweep velocity, approach velocity and, if relevant, an effective by-pass which returns fish to an actively flowing braid of the Lower Waitaki River;
  - (ii) A report from the Certifiers which certifies and explains how the certified design and operation of the screen or deflection barrier:
    - Demonstrates best practice in achievement of Condition 12(b);
    - Takes into consideration regional or national guidelines in relation to fish screen and/or deflection barrier design and/or any international guidelines that the Certifiers consider relevant.
- (f) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and the certifiers report referred to in Condition 12(e) and such approval shall not be unreasonably withheld.
- (g) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the screen or deflection barrier has occurred in accordance with the certified design plans approved in accordance with Condition 12(f).
- (h) After installation the consent holder shall commission an audit by an independent research organisation approved by the Canterbury Regional Council to determine the effectiveness of the screen or deflection barrier installed. The methodology to be adopted shall be approved by the Canterbury Regional Council. The consent holder shall provide the results of the audit to the Canterbury Regional Council within 18 months of the commissioning of the Hunter Downs Irrigation Scheme take.
- (i) The fish screen or deflection barrier shall be inspected for any damage causing fish to be entrained, impinged, entrapped or pass through the screen or device, within a 24 hour period and then at least once every following 48 hours, when the flow in the Lower Waitaki River at the Kurow Gauge (Kurow Gauge flow map ref: 140:079-088) as estimated by the Canterbury Regional Council is greater than either:
  - (i) 600 cubic metres per second; or
  - (ii) 450 cubic metres per second if consent CRC071903 (Meridian Energy Limited – North Bank Tunnel) or any subsequent replacement consent is operative.
- (j) Within 24 hours of the fish screen or deflection device becoming ineffective, the consent holder shall notify the Canterbury Regional Council of the situation, any remedial measures to be implemented, and the likely timeframes for implementing those measures. The consent holder shall use its reasonable endeavours to restore the effectiveness of the fish exclusion measures in accordance with Condition 12(b) as soon as possible. This consent shall not be exercised if the effectiveness of the fish screen or deflection device in accordance with Condition 12(b) has not been restored within 30 days of the fish screen or deflection device first becoming ineffective.
- (k) The area(s) of the outfall(s) from the intake overflow channel(s) shall be monitored twice monthly during October to February inclusive for the first 3 years of the exercise of this consent to ensure that there is no accumulation of native fish in the vicinity of the outfall(s) from the overflow channel(s).

#### SCHEME MANAGEMENT PLAN

- 13) Prior to exercise of this consent and the commissioning of the Hunter Downs Irrigation Scheme (the Scheme), the consent holder shall prepare and submit to the Canterbury Regional Council a Scheme Management Plan.

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- 14) In general, the Scheme Management Plan shall provide details of the practices and procedures to be put into place to operate the water take and delivery of water to the Scheme area and to monitor and manage the environmental effects arising from the use of the water within the Scheme, in order to ensure compliance with the conditions of consent and to minimise the potential for adverse effects on the environment arising from the exercise of this consent.
- 15) The Scheme Management Plan shall, as a minimum, include the following matters:
- (a) Operational requirements for the take of water for the Scheme from the Lower Waitaki River, including any water sharing arrangements with other abstractors during times of low flows in the Lower Waitaki River;
  - (b) Operational rules for the Scheme including responsibilities and arrangements for water management and distribution, including allocation during water shortages;
  - (c) A Template to be used as the basis for individual Farm Management Plans. The Farm Management Plan Template shall have the following objectives:
    - (i) To achieve technically efficient use of water, minimising runoff and drainage;
    - (ii) To minimise contamination of groundwater and surface water, particularly in terms of faecal contamination, Nitrogen and Phosphorus;
    - (iii) To minimise nutrient losses to water while managing soil fertility to optimise pasture and crop productivity;
    - (iv) To minimise adverse effects on groundwater and surface water levels;
    - (v) To maintain soil in good physical condition;
    - (vi) To minimise adverse effects on water bodies and riparian areas through healthy riparian margins;
    - (vii) To safeguard significant indigenous biodiversity and ecosystem values within the Scheme area;
    - (viii) To respect Ngai Tahu values in relation to freshwater;
    - (ix) To provide information to the consent holder including land use, area irrigated, stock numbers, and fertiliser use.
  - (d) The Template shall also include the requirements specified in Condition 20.
  - (d) Procedures to prepare, regularly review and update the Farm Management Plan Template, including provision for associated consultation with the Community and Ngai Tahu Liaison Groups and water users, and opportunity to receive, and give due consideration to, feedback from the these groups prior to finalising the initial Template, each review of, and any amendments to, the Template.
  - (e) Procedures to ensure the preparation, implementation, regular review, updating and obtaining consent holder approval for individual Farm Management Plans for all properties receiving water in terms of this consent. Individual Farm Management Plans, at the time of consent holder approval, shall be based on the current version of that Farm Management Plan Template and include the requirements of the Farm Management Plan Template specified in Condition 20.
  - (f) Provision for an annual internal audit of compliance with the provisions of the Farm Management Plans, including provision for consultation regarding the results of the audit with Community and Ngai Tahu Liaison Groups and water users. The annual audit is to be undertaken by a person who is independent of the consent holder. Such provision shall ensure that each individual Farm Management Plan is audited annually for each of the first 3 years following the initial delivery of water to that property or any increase in the quantity of water delivered to that property. After that time, every property which has received water for more than 3 years shall be audited at least once every 5 years, with at least 20% of Farm Management Plans being audited each year. The Scheme Management Plan shall ensure that a report of each audit is provided to the water users on each property audited and to the consent holder, and that an overall audit report is also prepared covering compliance generally on all properties audited.

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- (g) Compliance monitoring and enforcement procedures for water users, including the circumstances under which the provision of water to any property is not initially provided, or is restricted or supply ceased, as a result of any individual non-compliance with the implementation requirements of the individual Farm Management Plan for that property. The enforcement procedures shall specify how the following shall be implemented:
  - (i) That water from the Scheme not be provided by the consent holder, unless a Farm Management Plan has been prepared and the matters specified in Condition 20(c), (d) and (e), and Condition 20(a) where new irrigation infrastructure is to be installed, from the Farm Management Plan Template have been undertaken for the property to receive the water;
  - (ii) For minor non-compliance with no or minor short term actual adverse environmental effect, routine personal contact with the water user with follow-up written notification from the consent holder requiring compliance by water user with relevant provisions of the Farm Management Plan;
  - (iii) For significant non-compliance, or repeated minor non-compliance, with moderate actual or potential adverse environmental effect, immediate action from the consent holder requiring immediate compliance by water user with relevant provisions of Farm Management Plan including notification of water supply restriction within 10 days if non-compliance is not remedied;
  - (iv) For major and/or persistent non-compliance with serious or persistent actual or potential adverse environmental effects, immediate action from consent holder requiring immediate compliance by the water user with relevant provisions of Farm Management Plan including notification of water supply being ceased within 10 days if non-compliance is not remedied.
- (h) Provision for ongoing education, training and information to assist water users in preparation and implementation of individual Farm Management Plans, including efficient use of water, best practice farming and environmental management. Provision to extend this education, training and information to other properties within the overall Scheme Area that are not taking and using water under this consent, and make this available to properties within the Lower Waitaki River catchment downstream from the location of the water take for this consent;
- (i) Procedures to maintain an ongoing consultative relationship with South Canterbury / North Otago Ngai Tahu and with the communities of Waimate and Timaru Districts as relevant to the Scheme area;
- (j) Procedures to receive, record and respond to public complaints;
- (k) Reasonable measures to manage irrigation infrastructure that comprise the Scheme to:
  - (i) Minimise water loss and protect water quality, including provision for the sealing of water canals where this is necessary to prevent excessive loss of water through seepage from the canals,
  - (ii) Minimise the potential for operational bywash from the main headrace canal, and
  - (iii) Ensure that any normal operational bywash from the secondary distribution network of canals and races is discharged to engineered wetlands and/or to land and not directly to any surface waterway.
- (l) How the fish deflection barrier / fish screen, constructed in accordance with Condition 12, will be operated and maintained;
- (m) Details of the environmental monitoring requirements, including:
  - (i) The procedures for the preparation, implementation, evaluation, and regular updating, of a Scheme Monitoring Plan for the take from the Lower Waitaki River and the use of water within the Scheme Area, in accordance with Conditions 32 and 33;
  - (ii) The monitoring of the water take in order to determine compliance with Conditions 4 - 7;
- (n) Provisions for the establishment, collection and operation, by the consent holder, of a Scheme Environmental Management Fund, 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, including:
  - (i) Fund structure and management;

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- (ii) The level of levy (initially at least \$2 per hectare of irrigated land per annum);
- (iii) Criteria for selecting and approving projects involving fund expenditure, including receiving and having regard to recommendations from the Community and Ngai Tahu Liaison Groups;
- (iv) Criteria for a rebate of the levy to recompense water users for the capital costs of environmental enhancement work on water users' own properties, which is not otherwise required by their Farm Management Plan or the consent conditions (up to 50% rebate of the levy paid by any one water user in any one year).
- (v) The criteria for increasing the levy over time.

Priority, for the distribution and use by the consent holder of the Scheme Environmental Management Fund, shall be provided to the following environmental mitigation which is not otherwise required by the individual Farm Management Plans or specific consent conditions, and shall also be informed by the results and analysis of the Scheme monitoring undertaken and reported in accordance with Conditions 32, 33 and 34:

- Physical protection of, stock exclusion from, weed management and indigenous vegetation planting along riparian margins and wetlands around Wainono Lagoon;
- Physical protection of, stock exclusion from, and indigenous vegetation planting along riparian margins of rivers and streams;
- Wetland enhancement and wetland creation, including the development of wetlands along intermittent streams;
- Permanent protection of wetland areas that could contain mudfish.

- 16) The consent holder shall at all times comply with and implement the current provisions of the Scheme Management Plan, except to the extent that the Scheme Management Plan or any of its provisions are inconsistent with the conditions of this consent.
- 17) Following the commissioning of the scheme, the consent holder shall review the Scheme Management Plan annually by 31 July each year for the first five years, and then by 31 July every three years thereafter, in consultation with the Canterbury Regional Council. Each review will take into account the information gained from the monitoring required by the conditions of this consent. The review shall:
  - (a) assess whether management practices are resulting in compliance with the conditions of this consent, and whether the requirements of the Scheme Management Plan in Conditions 13 and 14 above are being met through the actions and methods undertaken to implement the Scheme Management Plan; and
  - (b) propose any amendments that the consent holder considers necessary to better achieve the requirements of the Scheme Management Plan in Conditions 14 and 15 above.
- 18) Prior to finalising its initial Scheme Management Plan, and then prior to each review of, and any amendments to, the Scheme Management Plan, the consent holder shall provide the proposed Plan, the annual reviews, and any proposed amendments, to the Community and Ngai Tahu Liaison Groups. The consent holder shall then receive, and give due consideration to feedback from the Community and Ngai Tahu Liaison Groups prior to finalising the initial Scheme Management Plan, each review of, and any amendments to, the Scheme Management Plan.
- 19) Following the completion of the process outlined in Conditions 17 and 18 above, the consent holder shall provide the initial Scheme Management Plan and each amended Scheme Management Plan to Canterbury Regional Council, along with the consent holder's Annual Environmental Report (refer Condition 34 of this Consent).

#### FARM MANAGEMENT PLAN TEMPLATE

- 20) The Farm Management Plan Template included in the Scheme Management Plan and prepared, reviewed and updated in accordance with Conditions 14(c) and (d) above shall include the following requirements:

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- (a) That all new irrigation infrastructure is designed and accredited by a qualified professional, and installed in accordance with the accredited design. The design shall take into account the specific requirements of any individual fragi pallic soils on the property;
- (b) That, for any property receiving water from the Scheme that is currently using existing irrigation infrastructure that has not received design approval from an accredited designer, the consent holder is provided with an evaluation report prepared by a certified irrigation evaluator within 12 months of the property first receiving water from the Scheme, and any upgrades identified in the report are implemented within the following 12 months, in order to achieve efficient water use.
- (c) That a nutrient budget is prepared and implemented for all properties receiving water from the Scheme;
- (d) That mechanisms are implemented to ensure that cattle, pigs, and deer are excluded from Rivers and Wetlands (as defined in the Resource Management Act 1991) adjoining land being irrigated;
- (e) That any potential mudfish sites, from which cattle, pigs, and deer are not otherwise excluded in terms of (d) above, are surveyed by an appropriately qualified person and, if found to be actual mudfish habitat, then mechanisms are implemented to ensure that cattle, pigs, and deer are excluded from such sites in accordance with (d) above, or an equivalent habitat is provided and the mudfish relocated to the alternative habitat;
- (f) That, for each property, for each 12 month period ending 30 June:
  - (i) either, it is demonstrated, via the nutrient budget required in (c) above, that the average total nitrogen (fertiliser and effluent) application has been less than 200 kgN/ha/yr; or
  - (ii) approved methods are used to undertake calculations or measurements of the average annual concentration of nitrate nitrogen in the soil drainage below the plant root zone and the actions in (iii), (iv) or (v) below are implemented depending on the calculated or measured nitrate concentration. For the purposes of this rule, approved methods shall be:
    - Calculations using either the most recent version of the OVERSEER® model or the most recent version of the Soil Plant Atmosphere Model (SPASMO); or
    - Any other method of calculation or measurement approved by the Canterbury Regional Council.
  - (iii) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone as calculated in accordance with clause (ii) or measured, for the property exceeds 8 grams per cubic metre, management practices are implemented to reduce the loss of nitrate nitrogen to soil drainage water. These may include but not be limited to:
    - Split applications of nitrogen fertiliser
    - Timing of nitrogen fertiliser application to plant growth
    - Avoiding application of nitrogen fertiliser to saturated soil
    - Avoiding applying nitrogen fertiliser when the soil temperature at 10 cm depth is less than 10°C
  - (iv) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone calculated in accordance with clause (ii), exceeds 12 grams per cubic metre of nitrate nitrogen:
    - Nitrification inhibitors, winter cover crops, or appropriate technology or management practice, implemented to reduce the loss of nitrate nitrogen to soil drainage water.
  - (v) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone calculated in accordance with clause (ii) or measured, exceeds 16 grams per cubic metre of nitrate nitrogen:
    - The average total nitrogen (fertiliser and effluent) application to that property is limited to 200 kgN/ha/yr.
- (g) That the following records are kept for each property and made available to the consent holder, in a form that is suitable to be made available to Canterbury Regional Council on request:
  - (i) Timing and rate of inorganic fertiliser applications
  - (ii) Timing and rate of nitrification inhibitor applications;

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- (iii) Stocking rates (number and type of animals) on an annual basis; and
- (iv) Land uses, including timing and type of cultivation activities.

#### WATER SUPPLY AGREEMENT BETWEEN CONSENT HOLDER AND OWNERS OF PROPERTIES WHERE WATER IS TO BE USED

- 21) No water from the Hunter Downs Irrigation Scheme shall be provided by the consent holder to any property unless, over that property, there is a written Water Supply Agreement on standard terms between the consent holder and the owner of that property. This Water Supply Agreement shall include the following:
- (a) A requirement for an audit of the implementation of the individual Farm Management Plan for that property in accordance with the requirements of the Scheme Management Plan, and provision for access on to the property by the Scheme Manager or their nominated representative, in order to undertake such an audit and/or to undertake spot checks of compliance with the implementation requirements of the Farm Management Plan and/or to undertake environmental monitoring in accordance with the requirements of the resource consent for the Hunter Downs Irrigation Scheme;
  - (b) A provision enabling the consent holder to not initially supply, and once supply has commenced to restrict or cease the supply of water to that property in the circumstances specified in Conditions 23 and 24, and in accordance with the relevant provisions of the Scheme Management Plan;
  - (c) A requirement that the annual volume of irrigation water applied from all sources shall not exceed 6270 cubic metres per hectare of land over which the irrigation water is to be applied, as identified in the Farm Management Plan for that property.
- 22) Any change of party to a Water Supply Agreement under these conditions shall be notified to the Canterbury Regional Council.

#### SUPPLY OF WATER FROM CONSENT HOLDER TO PROPERTIES WHERE WATER IS USED

- 23) No water from the Hunter Downs Irrigation Scheme shall be provided by the consent holder to a property unless, prior to first receiving water from the Scheme;
- (a) a Farm Management Plan has been prepared for that property, in accordance with the Template contained in the Scheme Management Plan, and the Farm Management Plan has been approved by the consent holder; and
  - (b) the matters specified in Condition 20(c), (d) and (e), and Condition 20(a) where new irrigation infrastructure is to be installed, from the Farm Management Plan Template have been undertaken for that property.
- 24) In accordance with the procedures for restricting and/or ceasing supply of water set out in the Scheme Management Plan (Condition 15(g)), no water from the Hunter Downs Irrigation Scheme shall continue to be provided by the consent holder to a property where there is a continuing breach of the following requirements:
- (a) that the current provisions of the individual Farm Management Plan, for each property receiving water from the Scheme, are at all times complied with and implemented; and
  - (b) that the individual Farm Management Plan is regularly reviewed and updated in accordance with the current Farm Management Plan template, and each review of the Farm Management Plan is approved by the consent holder.
- 25) The annual volume of water provided to each property by the consent holder shall not exceed 6270 cubic metres per hectare of land over which the irrigation water is to be applied as identified in the Farm Management Plan for that property.

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## COMMUNITY LIAISON GROUP

- 26) (a) The consent holder shall, prior to the exercise of this consent, undertake an open, public process to offer membership positions on a Community Liaison Group.
- (b) The Community Liaison Group shall consist of a maximum of five persons with a preference for representatives who can each demonstrate skills or knowledge in at least one of the following:
- (i) Recreational uses of the Lower Waitaki River and South Canterbury Region;
  - (ii) Sustainable irrigated agricultural practices;
  - (iii) Water quality and sustainable land management;
  - (iv) Community and/or business in South Canterbury;
  - (v) Lowland drainage network operation;
  - (vi) Management of indigenous biodiversity.
- (c) The members of the Community Liaison Group shall be offered the opportunity to meet every 6 months, or less frequently as determined by the Community Liaison Group, an annual inspection of the Scheme area, and the provision of any information to which Canterbury Regional Council is entitled by virtue of this consent, at the consent holder's expense.
- (d) If the Community Liaison Group elects to hold a meeting in accordance with Condition 26(c), then the Scheme Manager or their nominated representative shall attend the meeting.
- (e) At least one representative from each of Canterbury Regional Council (in its resource consent regulatory capacity); Canterbury Regional Council (in its river and drainage management capacity); and Waimate District Council shall be invited to attend meetings.
- (f) The main purposes of the meetings of the Community Liaison Group are to:
- (i) Provide input and feedback into the preparation, implementation, review and amendment of the Scheme Management Plan and the Farm Management Plan templates;
  - (ii) Be presented by, and discuss with, the consent holder the Scheme Monitoring Plan and the results of monitoring and reporting as required by the conditions of this consent, including the Annual Environmental Report and the annual overall audit report on compliance with the Farm Management Plans, prepared by the consent holder;
  - (iii) Discuss, as far as practicable, any community concerns regarding the operation of the Hunter Downs irrigation scheme.
  - (iv) Review and recommend to the consent holder projects for the distribution of funds from the environmental levy to environmental mitigation projects in accordance with Condition 15(n).
- (g) In particular, the members of the Community Liaison Group shall be offered the opportunity to review and comment on the initial Scheme Management Plan and the initial Farm Management Plan templates, the reviews of and any amendments to the Scheme Management Plan and Farm Management Plan templates, the consent holder's Annual Environmental Report including the annual overall audit report on compliance with the Farm Management Plans.
- (h) The Community Liaison Group will be provided with the opportunity to submit information to the Canterbury Regional Council annually in relation to the review of the Scheme Management Plan and the template for the Farm Management Plans.

## NGAI TAHU LIAISON GROUP

- 27) (a) The consent holder shall, prior to the exercise of the consent, offer Te Runanga o Ngai Tahu, Te Runanga o Arowhenua, Te Runanga o Waihao, Te Runanga o Moeraki and other manawhenua the opportunity to establish a Ngai Tahu Liaison Group of up to six persons.
- (b) The members of the Ngai Tahu Liaison Group shall be offered the opportunity to meet, every 6 months, or less frequently as determined by the Ngai Tahu Liaison Group, an annual inspection of the Scheme area, and the provision of any information to which Canterbury Regional Council is entitled by virtue of this consent, at the consent holder's expense.
- (c) If the Ngai Tahu Liaison Group elects to hold a meeting in accordance with Condition 27(b), then the Scheme Manager or their nominated representative shall attend the meeting.
- (d) The main purposes of the meetings of the Ngai Tahu Liaison Group are to:
- (i) Provide input and feedback into the preparation, implementation, review and amendment of the Scheme Management Plan and the Farm Management Plan templates;

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- (ii) Be presented by, and discuss with, the consent holder the Scheme Monitoring Plan and the results of monitoring and reporting as required by the conditions of this consent, including the Annual Environmental Report and the annual overall audit report on compliance with the Farm Management Plans, prepared by the consent holder;
- (iii) Discuss, as far as practicable, any Ngai Tahu concerns regarding the operation of the Hunter Downs irrigation scheme.
- (iv) Review and recommend to the consent holder projects for the distribution of funds from the environmental levy to environmental management projects in accordance with Condition 15(n).
- (e) In particular, the members of the Ngai Tahu Liaison Group shall be offered the opportunity to review and comment on the initial Scheme Management Plan and the initial Farm Management Plan templates, the reviews of and any amendments to the Scheme Management Plan and Farm Management Plan templates, the consent holder's Annual Environmental Report including the annual overall audit report on compliance with the Farm Management Plans.
- (f) The Ngai Tahu Liaison Group will be provided with the opportunity to submit information to the Canterbury Regional Council annually in relation to the review of the Scheme Management Plan and the Farm Management Plan templates.

#### COSTS OF THE LIAISON GROUPS

- 28) The consent holder shall meet the reasonable costs of the Community and Ngai Tahu Liaison Groups undertaking their functions in accordance with the conditions of this consent.

#### SUITABLE PERSON FOR SCHEME MANAGEMENT, MANAGEMENT PLANS, MONITORING AND ENVIRONMENTAL REPORTING

- 29) The consent holder shall retain a suitably qualified and/or experienced person or persons to operate the Hunter Downs Irrigation Scheme, to supervise the preparation, review and implementation of the Scheme Management Plan and the Farm Management Plan template, to assist with the preparation, review and implementation of the individual Farm Management Plans, to ensure compliance with the conditions of this consent, the implementation and review of the monitoring required by these consent conditions, and the preparation of the Annual Environmental Report.

#### SCHEME PRE-COMMISSIONING MONITORING PLAN

- 30) Within one year of the granting of the consents for the intake and pumping facilities and main headrace canal for the Hunter Downs Irrigation Scheme, the consent holder shall submit to Canterbury Regional Council a Scheme Pre-commissioning Monitoring Plan for the Scheme Area. The Scheme Pre-commissioning Monitoring Plan shall specify the monitoring which shall be undertaken prior to the commissioning of the Scheme. This monitoring shall maintain and update the data used in the assessments of effects for this consent so that sufficient data is available at consistent locations and sampling frequency in order to provide current and comprehensive existing environmental baseline information at the time of Scheme commissioning, against which to compare post-commissioning monitoring undertaken in terms of Conditions 32 and 33. Prior to submitting the Scheme Pre-commissioning Monitoring Plan to Canterbury Regional Council, the consent holder shall consult with Canterbury Regional Council (both in its resource consent regulatory capacity and its river and drainage management capacity) regarding the pre-commissioning monitoring proposed to be undertaken. The Scheme Pre-commissioning Monitoring Plan shall include the following, amongst other matters:
  - (a) Physical and chemical ground and surface water quality;
  - (b) Macrophytes and periphyton in rivers and streams;
  - (c) Phytoplankton in Wainono Lagoon;
  - (d) Macroinvertebrates in surface waters;
  - (e) Native fish, in particular Canterbury mudfish, whitebait and long-finned eels;
  - (f) Trout;

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- (g) Riparian vegetation and habitat;
  - (h) Wetlands, including birds and sedgeland and turfland communities at Wainono Lagoon;
  - (i) Groundwater and surface water levels and the operation of drainage/flood protection infrastructure associated with the Wainono Lagoon catchment;
  - (j) Sedimentation of Wainono Lagoon.
- 31) Prior to the exercise of this consent, the consent holder will undertake monitoring in accordance with the Scheme Pre-commissioning Monitoring Plan. A summary of the results and the analysis of all monitoring undertaken in terms of the Scheme Pre-commissioning Monitoring Plan is to be provided annually to the Canterbury Regional Council by no later than 31 July for each year that it is required from the date specified in Condition 30 above until the Scheme is commissioned.

#### SCHEME MONITORING PLAN

- 32) At least six months prior to the commissioning of the Hunter Downs Irrigation Scheme and the exercise of this consent, the consent holder shall submit to Canterbury Regional Council a Scheme Monitoring Plan for the Scheme Area. The Scheme Monitoring Plan shall identify the location, sampling and frequency of monitoring throughout the exercise of this consent, and any analyses that will be undertaken on the basis of the proposed monitoring information. Prior to submitting the Scheme Monitoring Plan to Canterbury Regional Council, the consent holder shall consult with Canterbury Regional Council (both in its resource consent regulatory capacity and its river and drainage management capacity), and offer to consult with the Community and Ngai Tahu Liaison Groups, regarding the monitoring proposed to be undertaken. The monitoring program shall include:
- (a) Ground and surface water quality for the purposes of monitoring, and identifying the potential cause of any changes in relation to ecological, contact recreation and potable water supply parameters as a result of the exercise of this consent. The water quality monitoring programme for the Scheme area shall be undertaken at representative sites as determined by a suitably qualified person in each of the following catchments and shall include monitoring for the parameters listed below:
    - Waihao River Catchment, including its Dead Arm
    - Waimate Creek Catchment
    - Wainono Lagoon and its Catchment, including its associated drainage/flood protection infrastructure
    - Hook River Catchment
    - Makikihi River Catchment
    - Kohika River Catchment
    - Otaio River Catchment
    - Pareora River Catchment
- Parameters shall include:*
- Nitrate – Nitrogen;
  - Ammonia – Nitrogen;
  - Total Nitrogen;
  - Dissolved Inorganic Nitrogen (for surface water samples only);
  - Total Phosphorus (for surface water samples only);
  - Dissolved Reactive Phosphorus (for surface water samples only);
  - Conductivity;
  - Temperature (surface water sites only);
  - pH;
  - Dissolved Oxygen (surface water sites only);
  - E-Coli, including at 3 recognised swimming sites in the Lower Pareora River (at Brassells Bridge), Waihao River (at Black Hole) and Lower Waihao River (at Bradshaws Ponds);
  - Colour and clarity (surface water sites only);
  - Emergent macrophytes, filamentous algae and algae mats (surface water sites only);

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- Vegetation in drains and other waterways that are part of the drainage/flood protection system associated with the Wainono Lagoon catchment;
  - Embeddedness of bed substrate (surface water sites only);
  - Chlorophyll a concentration (Wainono Lagoon only);
  - Works undertaken by Canterbury Regional Council to control vegetation in the grassed waterways associated with the Lower Pareora River Control Scheme.
- (b) Monitoring of the following species and ecological communities, in the catchments specified in (a) above, in order to provide a periodic comparison with baseline information from pre-commissioning monitoring:
- Macroinvertebrates;
  - Native fish, in particular Canterbury mudfish, whitebait and long-finned eels;
  - Trout;
  - Riparian vegetation habitat;
  - Wetlands, including birds and sedgeland and turfland communities at Wainono Lagoon, using MfE Guidance on monitoring wetlands (Clarkson et al., 2004), or equivalent.
- (c) Monitoring effects on groundwater and surface water levels and on drainage/flood protection infrastructure associated with the Wainono Lagoon catchment, including:
- Groundwater levels in locations that are representative of the Wainono Lagoon Catchment, the low-lying areas around Wainono Lagoon, its drainage/flood protection infrastructure, and the land adjoining the Dead Arm of the Waihao River;
  - Representative climate data;
  - Surface water levels at the Waihao River outlet in vicinity of the Waihao Box, and from the existing Poingdestres Road water level recorder on the Dead Arm of the Waihao River, including the relationship with surface water levels in Wainono Lagoon;
  - Frequency, timing and duration of opening of the Waihao Box, and relationship with surface water levels in Wainono Lagoon and in the Dead Arm of the Waihao River;
  - Information from Canterbury Regional Council regarding maintenance requirements relating to vegetation control in and around Wainono Lagoon and its associated drains and streams.
- (d) Monitoring to establish an estimate of the rate of sedimentation of Wainono Lagoon, to assist with future understanding of the Wainono Lagoon ecosystems, using Lagoon depth and water levels from the existing Poingdestres Road water level recorder.
- (e) Monitoring to establish an understanding of the relationship between changes in the surface water levels and the extent of Wainono Lagoon.
- 33) The consent holder shall undertake monitoring in accordance with the Scheme Monitoring Plan.

#### ANNUAL ENVIRONMENTAL REPORT

- 34) The consent holder shall complete an Annual Environmental Report and provide it to the Canterbury Regional Council, by 31 July each year following the commissioning of the Hunter Downs Irrigation Scheme, covering the following matters:
- (a) A summary of the operation of the water take and use, and the associated river flows, in the preceding 12 months, based on the monitoring undertaken as part of the exercise of this consent, in particular Condition 11.
  - (b) An overall audit report covering compliance generally of all water users with the provisions of their Farm Management Plans in accordance with Condition 15(f).
  - (c) The results of the monitoring undertaken as part of the exercise of this consent in accordance with Conditions 11, 32 and 33.
  - (d) Explanations of any changes in the preceding 12 months from the previous Annual Environmental Report.
  - (e) A description of the off-farm environmental mitigation, monitoring and reporting intended to be carried out in the next 12 months with an approximate timetable of activities.

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- (f) A description and analysis of any unexpected adverse effect on the environment that has arisen as a result of the exercise of this consent in the last 12 months, the steps taken in response to that effect, and the results of those steps.

Copies of each Annual Environmental Report shall also be made available by the consent holder to all water users, the Regional Engineer of the Canterbury Regional Council, and the Community and Ngai Tahu Liaison Groups.

- 35) In addition to the Annual Environment Report required in terms of Condition 34, the consent holder shall prepare reports for the Regional Engineer of the Canterbury Regional Council regarding the monitoring of effects on groundwater and surface water levels and drainage/flood protection infrastructure associated with the Wainono Lagoon catchment in accordance with Condition 32(c). These shall record, analyse and report on the results of this monitoring work. Reports shall be completed and provided to the Regional Engineer when the Hunter Downs Irrigation Scheme reaches the point of 75% uptake of consented water for irrigation or at 5 years from the commissioning of the Scheme, whichever is sooner, and then at a frequency of 5 yearly thereafter.

#### RECORD KEEPING AND PROVISION OF INFORMATION TO CANTERBURY REGIONAL COUNCIL

- 36) All data required to be recorded, measured and calculated in accordance with the conditions of this consent, shall be provided to the Canterbury Regional Council on request, and shall be accessible and available for downloading by the Council.

The consent holder shall keep records of timing and rate of water supply to each property and shall make these available to Canterbury Regional Council on request.

#### REVIEW OF CONDITIONS

- 37) Canterbury Regional Council may, on the last working day of June each year, serve notice of its intention to review conditions of this consent for the purposes of dealing with any adverse effects on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage. However, this condition shall not be exercised for the first 3 years from the time at which this consent is first exercised, and shall not be exercised to review the same condition more than once in any 3 year period.
- 38) The consent authority may review condition 7 by giving notice in accordance with section 129 of the Act within 3 months of the completion of any review (pursuant to section 128(1)(b) of the Act) of, or any change to, a minimum flow condition of any other consent to take water from the Waitaki River for the purpose of considering the need for changes to condition 7 due to the temporal priority of said other consents.

#### GIVING EFFECT TO THIS CONSENT

- 39) Pursuant to Section 125 of the Resource Management Act 1991, the period within which the consent holder may give effect to this consent shall be 10 years from the grant of this consent provided that this condition will lapse automatically:
- (a) unless within five years of the date of this consent the consent holder lodges with the Canterbury Regional Council:
    - (i) evidence that it has commenced complying with the pre-commissioning conditions; and
    - (ii) complete applications for all primary consents necessary for the construction and use of the intake, diversion channel and the primary irrigation delivery system for the Hunter Downs Irrigation Scheme, and/ or

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- (b) if the necessary primary consents for the construction and use of the intake, diversion channel and the primary irrigation delivery system for the Hunter Downs Irrigation Scheme have been refused.

**Issued at Christchurch on 24 November 2011**

Canterbury Regional Council

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*Everything is connected*

***Hunter Downs Irrigation***

**Scheme Management Plan**

***DRAFT May 2011***

**(This draft management plan includes requirements set out in Conditions 13 – 28 of the Commissioners' decision (April 19 2010). It will be further updated prior to commissioning to incorporate all consent requirements, and operational and other details developed during detailed design stages)**



# **1. Introduction**

This management plan sets out the protocols, policies and procedures that the Hunter Downs Irrigation scheme (HDI) will follow in the development, operation and maintenance of the scheme (described below) in order to ensure that both the scheme operators and the water users can achieve high environmental standards and sustainable outcomes.

This Scheme Management Plan has been developed in accordance with the conditions of resource consent CRC071029, and in particular consent conditions (13) to (18). At all times HDI operates so that the Scheme complies with and implements this Scheme Management Plan.

*[This draft focuses on management of the water use, however the final plan would also include operational management matters related to the water take, including fish deflection and water sharing with other abstractors.]*

## **1.1 Scheme description**

Hunter Downs Irrigation is a community irrigation scheme that provides water to an irrigable area of 40,000 ha within a command area of 60,000 ha. The scheme takes water from the Waitaki River and delivers it to farms within the Waimate and Timaru Districts of South Canterbury. The scheme managed as six sub-scheme areas - Elephant Hill/Waihao Downs, Waimate, Makikihi, Otaio, Pareora and Otipua. The majority of the scheme area is within a narrow coastal band, ranging from the coast to about 10 - 16 km inland from the coast.

Elevation ranges from 200 m above msl to near zero m above msl.

### **3. Sustainability Approach**

The Scheme Management Plan (this document) sets the policies and protocols at the governance and management levels for the whole scheme. It provides leadership and commitment to achieving positive environmental outcomes.

HDI's goal is to ensure that all activities are carried out with a high standard of environmental care. The focus will be on active management and prevention of problems. To achieve this goal HDI is committed to:

- Ensuring that effective governance and risk management processes are in place;
- Taking all practicable steps to minimise adverse effects of obtaining, reticulating and using scheme water;
- Maximising efficiency in the use of resources and minimising waste;
- Working with water users and the wider community to address any adverse environmental effects of providing irrigation water;
- Ensuring a balance between agricultural productivity and environmental protection, both of which are essential for the long term productivity and sustainability of the area.

As a water scheme, the environmental focus is on the effects of obtaining, reticulating and using scheme water. HDI will

- Establish objectives and performance targets. Where practical, the targets will be measurable and time-based;
- Implement systems and processes to track the scheme's environmental performance and act on complaints and incidents;
- Use systematic methods of monitoring that are consistent with other water user monitoring requirements e.g. for on-farm quality assurance programmes;
- Adopt a training and information provider role so that new research results related to improvements in irrigated farming systems are readily available to all farmers.

#### **3.1 Farm Plans**

The Farm Management Plans for Irrigated Land Use (Farm Plans) put in place measures to avoid or minimise avoid or minimise adverse impacts of on-farm activities associated with irrigation, and implement best practice farming methods. These are implemented for each property that uses water from the Scheme, as required under consent CRC071029.

HDI uses a workshop process and individual support to help water users to prepare their Farm Plans. Further details on the Farm Plans are provided in other sections of this Protocol.

The requirement for a Farm Management Plan is set out as part of the contractual arrangements between HDI and the user for supply of water (water user agreement). This agreement includes environmental management obligations including:

- What user has to do – i.e. prepare, implement and review farm plan;
- What HDI has to make available e.g. workshops, climate data
- What HDI will do e.g. reviewing, auditing, monitoring

Using the monitoring and analysis, other experience from scheme operation and the results of ongoing research and development, HDI will implement active adaptive management to make changes to the scheme operation, including on-farm practices, if necessary.

For example, HDI takes an adaptive management approach to best practice riparian management, for any issues that may arise with increased surface water flows because of the effects of irrigation.

### **3.4 Information Provider Role**

HDI ensures that water users have ready access to appropriate weather and soil information, so that water users can schedule their irrigation according to evapotranspiration, rainfall and soil moisture status, as well as crop demand.

HDI makes the following information available to all water users so that water requirements can be correctly predicted:

- Access to climate station data (across the scheme) providing daily conditions during the irrigation season
  - Sunlight hours
  - Wind run
  - Temperatures
  - Humidity
  - Rainfall
- Potential evapotranspiration<sup>3</sup>;
- Predicted rainfall;
- Water budgeting tools that assist growers to determine irrigation scheduling. For example, if considered appropriate, reference soil moisture sites will be maintained.

### **3.5 Skills and Training**

HDI actively promotes and facilitates an ongoing training and education programme to support water users in on-farm irrigation system design and operational matters that can improve farm performance, maximise environmental benefits and minimise adverse effects. HDI is also proactive in making information on new technologies for best irrigated farming practice available to growers.

HDI facilitates workshops and other training opportunities for water users. Topics include:

- Preparation and implementation of Farm Management Plans;
- Development of irrigated farms, including:
  - Efficient use of water,
  - Understanding design specifications and KPI<sup>4</sup>s in relation to soils, climate, proposed land use and other relevant matters in the scheme area;

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<sup>3</sup> Evapotranspiration (ET): A value for reference ET would be calculated at a climate station, and can be used to calculate potential ET for different crops.

<sup>4</sup> Key performance indicators



## **4. Operation of the Scheme**

### **4.1 Responsibilities**

A scheme manager supervises the day to day operation of the scheme. The scheme manager and the management team operate the scheme to agreed service levels, and are responsible for implementing the environmental management requirements set out in this plan or required by the consents to operate the scheme.

Water allocation through the distribution network is managed in an equitable manner to meet on-farm water requirements, as far as possible. During any water-short periods, the scheme manager will reduce allocations by following processes (e.g. roster systems; proportional reductions) determined in consultation with water users and set out in the Operating Rules.

The scheme manager's role includes:

- Control of the intake, including disposal of sediment deposits;
- Distribution and management of irrigation water;
- Maintenance of all off-farm scheme infrastructure;
- Assisting water users to implement all on-farm environmental management requirements related to achieving sustainable irrigation;
- Scheme environmental and compliance monitoring, and record keeping;
- Responsibility for providing water users with education and training opportunities related sustainable irrigation practices.
- Contact point for the wider community

As required under CRC071029 (29), scheme management ensures that suitably skilled staff or contractors are available to operate the scheme and assist water users meet the scheme requirements to achieve the desired environmental outcomes, including efficient water use. This includes:

- Supervising the preparation, review and implementation of the Scheme Management Plan and Farm Management Plans;
- Assisting with preparation, review and implementation of the individual Farm Management Plans;
- Ensuring compliance with the scheme's consent conditions to take and use water;
- Implementing and reviewing the monitoring required by the scheme's consent conditions to take and use water;
- Preparing the Annual Environmental Report.

- Other matters, as set out in this plan, or otherwise agreed.

### **4.3.1 Environmental Reporting**

#### ***Annual Environmental Report***

HDI prepares an Annual Environmental Report and provides it to the Canterbury Regional Council by 31 July each year. This report is also be made available to all water users, the Regional Engineer of the Canterbury Regional Council, and the Community and Ngai Tahu Liaison Groups.

The Annual Report covers the following matters as required by CRC xxx (34) :

- A summary of the operation of the water take and use, and the associated river flows, in the preceding 12 months, based on the monitoring undertaken as part of the exercise of this consent, in particular Condition 11.
- An overall audit report covering compliance generally of all water users with the provisions of their Farm Management Plans in accordance with Condition 15(f).
- The results of the monitoring undertaken as part of the exercise of this consent in accordance with Conditions 11, 32 and 33.
- Explanations of any changes in the preceding 12 months from the previous Annual Environmental Report.
- A description of the off-farm environmental mitigation, monitoring and reporting intended to be carried out in the next 12 months with an approximate timetable of activities.
- A description and analysis of any unexpected adverse effect on the environment that has arisen as a result of the exercise of this consent in the last 12 months, the steps taken in response to that effect, and the results of those steps.

- Provide input and feedback into the preparation, implementation, review and amendment of the Scheme Management Plan and the Farm Management Plan templates;
- For HDI to present, and the Group to discuss, the Scheme Monitoring Plan and the results of monitoring and reporting required by the resource consents conditions, including the Annual Environmental Report and the annual overall audit report on compliance with the Farm Management Plans;
- Discuss and, as far as practicable, agree on remedies for any Ngai Tahu concerns regarding the operation of the Hunter Downs irrigation scheme.
- Review and recommend to the consent holder projects for the distribution of funds from the environmental levy to environmental management projects in accordance with Condition 15(n).

The Ngai Tahu Liaison Group members will be offered the opportunity to review and comment on:

- the initial Scheme Management Plan and the initial Farm Management Plan template
- the reviews of and any amendments to the Scheme Management Plan and Farm Management Plan template
- the Annual Environmental Report including the annual overall audit report on compliance with the Farm Management Plans.

The Ngai Tahu Liaison Group will be provided with the opportunity to submit information to the Canterbury Regional Council annually in relation to the review of the Scheme Management Plan and the Farm Management Plan templates.

The members of the Ngai Tahu Liaison Group will be invited to attend Scheme workshops, field days etc., including workshops held for irrigators to prepare their Farm Plans.

*[This section could incorporate any negotiated agreements with local iwi e.g. for restoration of streams, wetlands and spring areas]*

## **5.2 Liaison with Local Communities**

Local communities face changes as the development of the scheme proceeds. HDI endeavours to maintain effective, transparent and open communication and consultation with stakeholders associated with scheme activities.

### *Community Liaison Group*

HDI uses an open, public process to offer membership positions on a Community Liaison Group that provides a formal process for ongoing consultation with the wider community in the scheme area.



- the Annual Environmental Report including the annual overall audit report on compliance with the Farm Management Plans.

The Community Liaison Group will be given the opportunity to submit information to the Canterbury Regional Council annually in relation to the review of the Scheme Management Plan and the template for the Farm Management Plans.

The members of the Community Liaison Group will be invited to attend Scheme workshops, field days etc., including workshops held for irrigators to prepare their Farm Plans.

*[When finalised this Plan to include further details on process for appointment, term, remuneration (if any) etc]*

### 5.3 Biodiversity and Ecosystem Management

HDI recognises that biodiversity is a critical aspect of environmental management. HDI notes that the report “A Biodiversity Strategy for Canterbury Region”<sup>6</sup> has a target ‘That there is no further loss of significant habitats and ecosystems from 2010’.

The key threats to biodiversity that are particularly relevant to irrigation, especially new developments, include:

- Further loss of remaining patches of indigenous vegetation;
- Impact of shelterbelt removal where these function as wildlife corridors;
- Loss and degradation of riparian areas, impacting on water quality and wildlife movement;
- Lack of understanding and specific information on state of wetlands in the region;
- General lack of understanding and awareness of biodiversity issues.

While the scheme has potential adverse effects, it also provides opportunities to increase awareness and to protect and enhance areas of indigenous vegetation both on-farm and within the wider scheme area.

HDI actively incorporates enhancement of ecological values in managing the open channels and other scheme infrastructure, in ways that do not conflict with scheme operation.

#### **Canterbury mudfish**

The Canterbury mudfish (*Neochanna burrowsius*) is classified as ‘nationally endangered’ partly because of its restricted range, but also in recognition that its habitat is vulnerable to drought and drainage. The New Zealand Freshwater Fish Database contains 132 records of Canterbury mudfish, of which 32 are from the HDI scheme area, indicating that this area contains a significant proportion of the range of this endangered species. Sites in the scheme area where

<sup>6</sup> ‘A Biodiversity Strategy for the Canterbury Region’ Environment Canterbury Report Number: R08/13 ISBN: 978-1-86937-774-8 published February 2008. <http://www.ecan.govt.nz/Our+Environment/Land/Biodiversity/>

## 5.4 Efficient Water Use

HDI recognises 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 as possible. HDI targets loss minimization in the off-farm distribution network and highly efficient water use on-farm.

### *Scheme water distribution network*

- HDI minimises water losses in the off-farm distribution network through:
  - a high standard of design and construction of the supply canals and distribution system;
  - regular maintenance of the canals and distribution system to ensure they are as close to the design standard as possible;
  - Use of scheme control systems that can supply water on demand and avoid operational by-wash;
  - Regular review of the continuous monitoring of the volumes of water taken and distributed by the scheme to identify water losses

### *Supply of water*

- The annual water entitlement (volume etc) for each user is set out in individual water use agreements, based on an average 1 in 5 year annual application across the scheme of 627<sup>10</sup> mm and specific soil types;
- The scheme targets an overall application efficiency of at least 80%. If an individual on-farm system has an application efficiency less than 80%, then the seasonal volume provided may be restricted to the amount required at 80% efficiency to ensure reasonable use<sup>11</sup> of scheme water;
- On-demand availability encourages efficient use<sup>12</sup> by enabling irrigators to apply water 'little and often' to meet crop demand and soil moisture. The return period required by users will depend on on-farm infrastructure, crop type, weather etc. Typical return periods are expected to be 7-14 days<sup>13</sup>.
- HDI meters and records all water takes and provides users with reports that benchmark water efficiency performance across the scheme for different soil types and land uses. If poor efficiencies are noted these are reviewed to get improvements.

### *Water application*

- Water users are required to:

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<sup>10</sup> AEE GPF annex D

<sup>11</sup> **Reasonable use** is defined by NRRP definition of 'reasonable use test' (when applied to irrigation use) means 'a test of the technical efficiency of water use in the particular circumstances of the applicant. It will include consideration of such matters as the intended land-use activity; whether there are already existing consents for the use of water for the same area of land (either partially or totally); on-site physical factors such as soil water-holding capacity, and climatic factors such as rainfall and evaporation'.

<sup>12</sup> Note schemes which supply on roster systems may only supply every 10 – 12 days, which may cause over-watering.

<sup>13</sup> AEE: GPF annex D

The 'Dairying and Clean Streams Accord',<sup>16</sup> sets a minimum standard for dairy farms.

HDI also formulates and implements programmes to recognise irrigators' efforts to minimise N and P leaching and soil erosion.

To ensure that HDI has the ability to manage any nitrate-N problems, every water user who applies more than 200 kg N/ha/yr (fertiliser and effluent) must either calculate or measure the average annual concentration nitrate nitrogen in the soil drainage below the plant root zone and implement actions depending on the results. See Farm Plan section for further details.

#### *Surface Water Quality Monitoring*

#### *Groundwater Quality Monitoring*

[These sections will cover the scheme's water quality monitoring programme, including monitoring required by the consent conditions.]

## **5.6 Water Levels and Flows**

[This section will cover the scheme's programme for water level management and monitoring, including monitoring required by the consent conditions.]

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<sup>16</sup> "Dairying and Clean Streams Accord between Fonterra Co-operative Group, Regional Councils, Ministry for the Environment, and Ministry of Agriculture and Forestry" May 2003

- 20 (e) *That any potential mudfish sites, from which cattle, pigs, and deer are not otherwise excluded in terms of (d) above, are surveyed by an appropriately qualified person and, if found to be actual mudfish habitat, then mechanisms are implemented to ensure that cattle, pigs, and deer are excluded from such sites in accordance with (d) above, or an equivalent habitat is provided and the mudfish relocated to the alternative habitat;*

### **6.2.2 Updating the Farm Plan Template**

The Farm Plan Template is regularly reviewed and updated where necessary. When HDI reviews the Farm Plan Template, and /or proposes amendments, due consideration is taken of consultation with water users and with the Community and Ngai Tahu Liaison Groups.

*[Add specific procedures for these processes]*

### **6.2.3 Farm Plan Approval and Audit Process**

Farm Plans must be submitted to HDI for approval and signoff . When changes are made to on-farm management practices the plan must be updated and resubmitted for approval.

All plans are audited by an independent assessor. For the first three years of receiving scheme water (or an increase in water) each farm plan is audited annually. After that time those achieving full compliance will have longer periods between audits than those who do not. Each plan is independently audited at least once every 5 years. At least 20% of all Farm Management Plans are audited annually.

Audits are carried out by a suitably qualified and experienced person who can demonstrate that they understand the relevant irrigation and farm management practices, and the environmental management risks and opportunities. Following each audit the water user receives an audit report and will be required to remedy any problems that are identified.

*[A process for acknowledging the relative seriousness of different problems and the urgency for remedies will need to be developed]* Operational problems must be corrected before the next irrigation season.

All water users must be operating according to an approved Farm Plan. Failure to do this will invoke the scheme's enforcement procedures and supply of water may be reduced or cut-off or a fine imposed.

An overall audit report is prepared annually covering compliance with the Farm Plan on the properties audited that year. It is distributed to water users, Regional Council, Community Liaison group, Ngai Tahu liaison group.

### **6.2.4 Farm Plan Reporting**

Each water user is required to advise HDI, by 1 August each year, of any changes in the areas to be irrigated and associated land uses during the coming season. Fertiliser use; nitrification inhibitors, stock nos etc



- To safeguard significant indigenous biodiversity and ecosystem values within the Scheme area;
- To respect Ngai Tahu values in relation to freshwater;

### **6.3.1 Irrigation Management**

#### ***Goal***

The goal for best practice irrigation management is to use water efficiently, minimising runoff and drainage in order to avoid, remedy or mitigate problems arising from:

- Inefficient water application
- Ponding of irrigation water
- Excessive runoff of irrigation water
- Excessive losses to groundwater
- Drainage to other properties

#### ***Objectives and targets***

The objectives for management of irrigation on-farm cover design, operation and maintenance.

#### ***Design and Construction Objective***

**To ensure that all irrigation systems on the property are capable of operating to meet industry and scheme standards for best practice irrigation**

Achieving good on-farm irrigation system design has major financial and environmental benefits. Management options for achieving efficient water use are likely to be limited if the system design is poor. For new systems, use of suitably qualified designers and adherence to industry codes of practice and standards is, therefore, mandatory.

#### ***New Systems***

Prior to construction of new systems the proposed design must be submitted to HDI for review and approval by a suitably qualified independent person, appointed by HDI. The reviewer will be required to check that the design meets the 'Irrigation Code of Practice and Irrigation Design Standards' March 2007 Irrigation NZ (<http://www.irrigationnz.co.nz/assets/Uploads/CoP.pdf>), and is appropriate for the soils, topography and proposed land uses. Design information provided must include, where relevant:

- Location of water bodies (e.g. rivers, streams, drains, water courses, wetlands) and:
  - Any effects of construction activities on these (e.g. sedimentation)
  - Design measures to avoid application of irrigation water into water bodies or onto riparian areas
- Location of riparian and wetland buffers, proposed stock crossings, fencing, planting etc to ensure that cattle, deer and pigs are excluded, and leaching/runoff of contaminants is avoided.
- Location of any significant wetlands
- Location of pallic type soils (e.g. Timaru, Ngapara and Claremont)

necessary, then upgrade within 12 months, to meet scheme standards. The evaluation must be performed by a qualified person according to the requirements, where applicable<sup>20</sup>, of the Irrigation New Zealand Code of Practice for Irrigation Evaluation<sup>21</sup>.

The evaluation report should provide the information required by HDI on key performance indicators of water use efficiency and established performance benchmarks, as well as recommendations for improvements to the system, if the system does not meet required performance. HDI does not require reporting of indicators relating to the business performance e.g. labour, capital, productivity, returns etc.

### **Operation and Maintenance**

Objectives and targets for operation and maintenance cover best use of water, equipment maintenance, and staff skills and training for day-to-day operation. Excessive and/or persistent runoff or ponding will be considered as non-compliance with water use agreements, and will incur penalties.

All water users must regularly check and review the performance of their irrigation system and carry out repairs, maintenance and upgrades to ensure that they are operating as efficiently as possible. Evaluation methods suitable for spray systems and designed for non-specialist use include 'DIY Irrigation Evaluation' (Aqualinc) or 'Irrig8quick' (Page Bloomer).

If HDI determines that a water user is operating inefficiently (e.g. runoff issues or excessive water / ha), that user can be required to have a system evaluation performed by a qualified person and carry out recommended improvements. Where it is applicable<sup>22</sup>, this evaluation must meet the requirements of the 'Irrigation New Zealand Code of Practice for Irrigation Evaluation' (2006) <http://www.irrigationnz.co.nz/publications/code-of-practice/>.

As a minimum the evaluation for spray systems should report on:

- Pressures at critical design points;
- Pump pressures and flows; and
- Electrical readings (voltage, amps, etc.) under load.
- Measured application uniformity expressed as CUC<sup>23</sup>;
- Estimated surface run-off losses;
- Estimated on-farm irrigation efficiency.

Other water users would be required to report on an evaluation of their system that describes how they comply with HDI requirements for water supply.

<sup>20</sup> The code applies to pressurised systems including drip, pivot, spray line, travelling and linear move irrigators

<sup>21</sup> Irrigation Evaluation Code of Practice (2006) Irrigation New Zealand  
<http://www.pagebloomer.co.nz/documents/COP1Introduction.pdf>

<sup>22</sup> The code applies to pressurised systems including drip, pivot, spray line, travelling and linear move irrigators

<sup>23</sup> CUC is Christensen's coefficient of uniformity and is defined in the "Irrigation Code of Practice and Irrigation Design Standards"

### 6.3.2 Soils Management

#### *Goal*

The goal for best practice soils management is to maintain or improve the physical and biological condition of the soils in the scheme area in order to avoid, remedy or mitigate problems arising from:

- loss of topsoil by wind or water erosion
- movement of soil and contaminants into rivers and streams
- damage to soil structure and health
- contamination of soil

#### *Objectives and targets*

##### **Objectives:**

- **To minimise the incidence of wind and/or water erosion caused as a result of farming practices.**
- **To optimise soil structure and soil biological activity**
- **To minimise the risk of soil contamination from fertiliser inputs.**

On-farm systems need to be designed to minimise or eliminate problems with soil breakdown and movement caused by the impact of irrigation water (e.g. from high volume sprinkler irrigation) on soil particles. To reduce problems it may be necessary to avoid using particular types of irrigation systems on certain soil types and under some cultivation / farming systems.

To avoid soil and contaminants getting into rivers and streams, spray irrigation systems must be operated to apply water at rates that do not result in surface runoff . To minimise soil (and contaminant) loss in the event of heavy rainfall on land with high soil moisture levels suitable riparian buffers must be provided in accordance with best management practices adjacent to rivers and streams. (see Waterway Management section)

#### *Soils Description*

About 90% of the scheme area comprises moderate or deep water holding capacity soils which require that both the rate and quantity of irrigation applied are very well controlled to avoid water logging and drainage problems down-gradient of the scheme near the coast.

These pallic type soils (e.g. Claremont, Opuha and Timaru soils) are particularly susceptible to degradation of soil structure especially where:

- Soil organic matter levels are low
- Soil structural resilience is low
- Winter grazing pressure is high

Farm Plans must identify grazing management strategies that will be used to avoid, minimise or mitigate degradation of soil structure integrity on these soils. These could include:

- Winter grazing arrangements to avoid soil treading and compaction damage by stock on wet soils (e.g. feed pads, stand off pads, off-farm grazing)

The approved methods are:

- Calculations using either the most recent version of the OVERSEER® model or the most recent version of the Soil Plant Atmosphere Model (SPASMO); or
- Any other method of calculation or measurement approved by the Canterbury Regional Council.

Depending on the nitrate concentration determined, the actions in (a), (b) and (c) below must be implemented.

**(a) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone exceeds 8 grams per cubic metre, management practices must be implemented to reduce the loss of nitrate nitrogen to soil drainage water. These may include but are not limited to:**

- Split applications of nitrogen fertiliser
- Timing of nitrogen fertiliser application to plant growth
- Avoiding application of nitrogen fertiliser to saturated soil
- Avoiding applying nitrogen fertiliser when the soil temperature at 10 cm depth is less than 10°C

**(b) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone exceeds 12 grams per cubic metre of nitrate nitrogen:**

- Nitrification inhibitors, winter cover crops, or appropriate technology or management practice, implemented to reduce the loss of nitrate nitrogen to soil drainage water.

**(c) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone exceeds 16 grams per cubic metre of nitrate nitrogen then, the average total nitrogen (fertiliser and effluent) application to that property is limited to 200 kgN/ha/yr.**

#### **6.3.4 Collected Effluent Management**

The goal for effluent management is to manage effluent systems to optimise the productive benefits of animal effluent while taking all practical steps to avoid contamination of ground and surface water in order to avoid, remedy or mitigate:

- Contamination of groundwater and surface water, especially faecal, N, P

##### ***Objectives and Targets***

HDI notes that managing collected animal effluent is not a scheme responsibility, but water users must adhere to Canterbury Regional Council requirements and obtain consents if required.

However, HDI recognises that the risks to the environment from poor effluent management can



### **6.3.6 Biodiversity and Ecosystem Management**

The scheme goal is to include biodiversity and ecosystem management as an integral part of farm management in order to avoid, remedy, or mitigate:

- Loss of native plants and native animals and their habitats;
- Loss of ecosystem diversity
- Loss of habitat for pollinators, beneficial birds, insects etc
- Loss of shelter for stock, crops and soil conservation

HDI will encourage suitable riparian planting for river, stream and wetland health and biodiversity. Where shelter and other plantings are removed for irrigation development, HDI encourages that consideration be given to replacing these with native species in suitable locations.

Mudfish habitat must be identified and managed appropriately or the mudfish relocated to suitable habitat.

- For minor non-compliance with no, or minor, short term actual adverse environmental effect, HDI makes routine personal contact with the water user with follow-up written notification requiring that the water user complies with relevant provisions of the Farm Management Plan;
- For significant non-compliance, or repeated minor non-compliance, with moderate actual or potential adverse environmental effect, HDI urgently takes action to get the water user to comply immediately with relevant provisions of Farm Management Plan, and will notify the user that water supply will be restricted within 10 days if the non-compliance is not remedied;
- For major and/or persistent non-compliance with serious or persistent actual or potential adverse environmental effects, HDI urgently takes action to get the water user to comply immediately with relevant provisions of Farm Management Plan and notifies the user that water supply will cease within 10 days if non-compliance is not remedied.

### 7.3 Compliance committee

HDI has a compliance committee to deal with major and/or persistent that cannot otherwise be resolved (e.g. through warnings, discussion and advice), or may have incurred costs to HDI or others. This committee has the power to:

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

The committee has a membership of three:

- Two appointed by HDI;
- An independent chairman (appointed by HDI following consultation with the Community Liaison Group) to ensure that the committee has a balanced representation that includes both farming and environmental management expertise.

*[Add further details of the appointment process, role etc, including providing an opportunity for the Community Liaison group and Ngai Tahu Liaison group to provide their views to any compliance hearing.]*

- *[Need to establish criteria, including what applies (e.g. plantings, fencing, stock crossings); whether expenditure can qualify for rebates in more than one year; need for receipts/evidence of expenditure];*

## 8.3 Allocation of Funds

HDI manages and distributes the funds, in consultation with the Community and Ngai Tahu Liaison groups. Funds are allocated following a public process calling for applications on the prescribed application form.

When allocating funds to projects, HDI consults with both the Community and Ngai Tahu Liaison groups and receives and has regard to their recommendations.

### 8.3.1 Criteria for Selecting Projects

Applications will be judged on the extent to which they will contribute to maintaining and enhancing environmental management within the scheme area.

As required under CRCxxxxx condition 15(n)9v), priority will be given to projects that contribute to:

- Physical protection of, stock exclusion from, weed management and indigenous vegetation planting along riparian margins and wetlands round Wainono Lagoon;
- Physical protection of, stock exclusion from, and indigenous vegetation planting, along riparian margins of rivers and streams;
- Wetland enhancement and wetland creation, including the development of wetlands along intermittent streams;
- Permanent protection of wetland areas that could contain mudfish.

Priority for funding will also take into account the results and analysis of Scheme monitoring, particularly that undertaken in accordance with CRCxxxxx conditions 32, 33 and 34.

Criteria that are considered in the evaluation of applications are:

- The likely outcomes of the project, including ecological outcomes of wider benefit such as:
  - Maintaining ecological processes;
  - Restoring connectivity between existing indigenous vegetation or existing habitats of indigenous species;
  - Providing a buffer for the habitat of indigenous species;
- The extent to which the project benefits important cultural, spiritual, historical or traditional values;
- The extent to which the project broadens the base of community effort and level of support for biodiversity and sustainable land management;
- The contribution to the project from other sources (including in-kind contributions);
- Overall value for money, based on costs and the potential benefits;
- The feasibility of the project to achieve its stated objectives;

