NORTH OTAGO
Irrigation Company

FEP ID No.	
Offtake No.(s).	
No. NOIC Shares	
Date Prepared	

Farm Environment Plan

A Farm Environment Plan (FEP) is a tool to help you recognise on-farm environmental risks and put in place practices to manage those risks. North Otago Irrigation Company's (NOIC) resource consent to use water from the Waitaki River for irrigation requires **ALL** NOIC shareholders to have a FEP. FEPs apply to the whole farm area, including dryland sections of the property. More than one property can be covered under one FEP, if it is operated as a single farming unit (i.e. dairy platform and run-off or support block). The key requirements of your FEP will be:

- A farm map showing the areas of environmental risk
- The good management practices (GMP) you implement on farm to manage (reduce or eliminate) those risks
- Documentation that provides evidence of GMP, such as soil tests, bucket tests, nutrient budgets and soil moisture monitoring.

Shareholders with 11 shares or more will be audited by an independent auditor (shareholders with 10 shares or less do not require an audit). You will receive notice at least 10 working days prior to an audit. Audit grades will be determined based on the auditor's level of confidence that you are implementing the GMPs required, managing the risks and achieving the objectives identified in your FEP. An A or B grade is considered a pass, a C or D grade is considered a fail.

Audits are required in the first year of new management. The frequency and cost of audits is determined by the grade received:

Audit Grade	Next Audit	Audit Cost
A	3 years	No cost
B	2 years	Auditor's fee at cost
C	1 year	Auditor's fee at cost + 25%
D	6 months	Auditor's fee at cost + 25%

Audit results are submitted to the Otago Regional Council. Any actions arising as a result of the audit must be completed within the agreed timeframe. NOIC will follow up with shareholders to ensure this has occurred. Operating to the standards stated in your FEP is a requirement; NOIC may suspend the supply of water if you fail to comply.

Please fill out the relevant sections of this document to complete your FEP and submit it to NOIC, along with your maps. Make sure you have the required evidence available to show the auditor – some people include live links to their recording templates (e.g. Google Docs) within the evidence column of their FEP, but paper records are fine. For advice and support please contact the Environmental Manager at NOIC, email: msearle@noic.co.nz or phone 0272672451

Glossary

Critical Source Area (CSA): a landscape feature such as a gully, swale, or depression that accumulates runoff from adjacent land; and delivers, or has the potential to deliver, 1 or more contaminants to 1 or more rivers, lakes, wetlands, or drains, or their beds (regardless of whether there is any water in them at the time)
Dairy Effluent Storage Calculator (DESC): The DESC is a calculator that determines the minimum volume of effluent storage required, and takes into consideration soil types, climate data and current or proposed on-farm effluent management. It is available at Dairy Effluent Storage Calculator (DESC) - DairyNZ

Effective Area: Area of farm used productively, excluding house, yards, effluent ponds, etc.

ET: Evapotranspiration - the amount of water lost from the soil due to plant use and evaporation (mm/day).

FEP: Farm Environment Plan

Field Capacity: The maximum amount of water that soil can hold before drainage/run-off occurs.

GHG: Greenhouse Gas Emissions

GMP: Good Management Practices. Download a copy of Industry-agreed Good Management Practices relating to water quality

Intensive Winter Grazing: means grazing livestock on an annual forage crop (**annual forage crop** means a crop that is grazed in the place where it is grown but does not include pasture or a crop that is grown for arable or horticultural use) at any time between 1 May and 30 September of the same year.

Mahinga Kai: Species, natural habitats, materials and practices used for harvesting food, and places where food or resources are, or were, gathered by Maori.

NOIC: North Otago Irrigation Company

Nutrient Budget: Estimates of nutrient flows in a farming system, including estimates of nitrogen and phosphorus loss to water through leaching and/or run-off. Nutrient budgets are typically prepared using a computer software model called OVERSEER©. Other accepted methods include the Soil Plant Atmosphere Model (SPASMO-HortResearch), and any other method approved by the Otago Regional Council.

PAW: Plant Available Water. The amount of water potentially available to plant growth that can be stored in the soil – i.e. between field capacity and permanent wilting point.

Permanent Wilting Point: The soil moisture content at which plants can no longer extract moisture from the soil and so wilt and die.

Pond Drop Test: A process of physical measurement that determines how well an effluent storage pond or tank is sealed by identifying level changes that may be associated with leaks.

Re-fill Point: Typically, 50% of PAW. When soil moisture levels fall below refill point, plant roots have to work harder to find water, so growth begins to slow.

VRI: Variable Rate Irrigation.

Watercourse (or waterway, or waterbody): Any continually or intermittently flowing body of fresh water (including creeks, drains and ditches) that connects downstream to another watercourse.

Section 1: Farm Information

Property name	
Physical address	

Property Owner					
Postal address				**Phone no.**	
		Postcode		**Mobile no.**	
Email address					
Contact person for owner (if different)					
Postal address				**Phone no.**	
		Postcode		**Mobile no.**	
Email address					

Is whole property leased?	**Yes/No. If yes, provide details:**	
Name of lessee:		
Postal address		**Phone no.**
	Postcode	**Mobile no.**
Email address		

Person responsible for day-to-day farm management & implementation of this FEP (if different to owner / lessee)			**Position (manager, sharemilker etc)**	
Postal address			**Phone no.**	
	Postcode		**Mobile no.**	
Email address				

Dairy Information			
Milk Supply Company		**Supplier No.**	
Milk Supply Company Data: I/we agree to NOIC obtaining and using data developed/collected by our milk supply company for this property.			(Tick ✓)

Nutrient Budget	I/we agree to NOIC accessing a year-end version of our most recent OverseerFM® nutrient budget file from our nominated fertiliser company or consultant.		(Tick ✓)
Nutrient budget prepared by		**Company**	
Resource Consents held			

Farm Mapping

Where applicable, show on maps:

- Boundaries
- Lease blocks – including owner name
- Blocks used in the nutrient budget (Land Management Units)
- Irrigated area by irrigation type
- Effluent area
- Feed pad
- Effluent pond
- Intensive Winter Grazing Plan (on separate map)
- **Watercourses**
  - The location of all watercourses, including drains
  - The location of riparian vegetation and fences adjacent to watercourses
  - The location of stock crossing points and any point where stock access occurs
- **Critical Source Areas**
- **Point Source Areas**
  - Bores/wells
  - Offal Pits
  - Silage Pits
  - Fertiliser and fuel storage
- **Biodiversity, biosecurity and cultural values**
  - Areas of conservation land or covenant
  - Significant Indigenous biodiversity
  - Biosecurity issues / pests
  - Public access routes
  - Rock Art
  - Mahinga Kai

TIP: NZ Landcare Trust has a webinar on creating farm maps using some of the free software tools that are available. https://www.youtube.com/watch?v=ociRT10RzOw However, printing off an aerial photo (e.g. from Google Earth) and marking it up is fine too!

Note that records of any complaints received in relation to the property since your last audit, or any other management issues identified by NOIC, will be provided to the auditor and considered in their assessment.

Farm Plan Areas	ha
Property area	
Effective area	
Lease block(s) area	
Lease block(s) effective area	
Total Area Covered by FEP	

Enterprise Type	Tick ✓
Dairy	
Dairy Support	
Sheep/Beef	
Mixed Cropping	
Lifestyle	
Other	

Irrigation Areas		
Irrigation Type	NOIC water irrigated area (ha)	Other water irrigated area (ha)
Pivot		
K-line		
Gun		
Long lateral		
Solid set		
Other		
Total Irrigated Area (ha)		

Effluent Areas	
No. days effluent Storage	
Application Type	**Area (ha)**
Pivot	
K-line /Pod	
Travelling Irrigator	
Other	
Total effluent area (ha)	

Dairy cows (peak)		**Dairy Wintered off**		**R1s and R2s**		**Dairy other**	
Beef cattle		**Breeding ewes**		**Sheep other**		**Pigs**	
Deer		**Stock other**		**Crops (type and ha)**			
Plantation Block (Ha and type)		**Riparian (Ha)**		**Other**			

Summary of Farming Operation

Write a blurb summarizing the farming operation so that someone who has never been on the property can pick up the FEP, read these paragraph(s) and have a reasonable handle on what goes on. Include details around stock types and numbers, irrigation (how much, type), any supporting blocks, effluent setup, crop area, etc.

Section 2: Irrigation Management

Objective: *The amount and timing of irrigation is managed to meet plant demands, minimise risk of leaching and runoff and ensure efficient water use.*

<table>
<tr><th>Required Practices</th><th>✓ or N/A</th><th>Evidence for Compliance / Records Required</th></tr>
<tr><td colspan="3">Target 1: New irrigation systems are designed and installed in accordance with industry codes of practice and standards.</td></tr>
<tr><td colspan="3">1.1 Design</td></tr>
<tr><td>Irrigation system is designed with site specific knowledge of the soils, crop needs and risks (watercourses, slopes, etc).</td><td></td><td>Application depth and rate are appropriate for soil type and slope, watercourses avoided, etc.</td></tr>
<tr><td>All new irrigation systems installed or replaced after 1 January 2015 meet The NZ Piped Irrigation System Design, and Installation Code of Practice (irrigationnz.co.nz)</td><td></td><td>Design Plans.
Irrigation designer suitably qualified.</td></tr>
<tr><td>If the irrigation system is used to distribute effluent, fertiliser or any other added contaminant or chemical, a backflow preventer must be installed and tested in accordance with the New Zealand Guideline for the Safe Management of Irrigation Systems with Effluent, Fertiliser and/or Agrichemical injection (irrigationnz.co.nz)</td><td></td><td>Certification by installer.</td></tr>
<tr><td colspan="3">1.2 Installation</td></tr>
<tr><td>Commissioning tests post installation show that the system performs to the desired specifications for application depth, rate and uniformity.</td><td></td><td>Commissioning report or post-installation evaluation report.</td></tr>
<tr><td>If necessary, the system is adjusted or fixed following commissioning test results.</td><td></td><td>Discussion.</td></tr>
<tr><td colspan="3">Target 2: 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.</td></tr>
<tr><td colspan="3">2.1 System Specifications</td></tr>
<tr><td>The total <u>depth</u> of irrigation water applied in one rotation does not exceed the amount required to restore soil moisture to field capacity.

The key components of this are knowing the water holding capacity of your soils and how much water your system applies in one rotation Fill out the table below:

Examples of the information required are provided in the first two rows.
<table>
<tr><th>Irrigation Block</th><th>Soil Type</th><th>PAW 30cm*</th><th>Application Rate/Time</th><th>Return Period</th><th>Application Depth</th></tr>
<tr><td>Pivot 1</td><td>Timaru</td><td>50mm</td><td>4mm/day</td><td>3 days</td><td>12mm</td></tr>
</table>
</td><td></td><td>System parameters provided.
Soil maps.</td></tr>
</table>

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
<table><tr><td>*K-line Block 1*</td><td>*Timaru*</td><td>*50mm*</td><td>*2.5mm/hr for 12 hours*</td><td>*8 days*</td><td>*30mm*</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> **** Plant available water (PAW)*** *The amount of water potentially available to plant growth that can be stored in the soil – i.e. between field capacity and permanent wilting point. Plants can only extract water where roots can grow. 30 cm is available to the widest range of crops, including shallow-rooting grasses and crops. Readily available water, i.e. the amount of water plants can easily extract before there is a growth check, is typically half PAW.*		**TIP:** If you don't know the PAW for the soils on your property, NOIC can provide this information to you using soil maps and factsheets from S-Map Online | Manaaki Whenua - Landcare Research - contact the Environmental Manager. **TIP**: Refill the soil moisture content to no more than 80% of the full point. Leave 20% for rainfall throughout the season. The result; reduced nitrate leaching with minimal impact on pasture production.
Ensure irrigation application ***rates*** do not exceed the infiltration rate of your soils. If water is being applied faster than the soil can absorb it, run-off will occur – even if the depth is adequate. Consider re-nozzling to lower the amount of water applied and returning more frequently.		System parameters Discussion and visual observation.
The irrigation system is operated to ensure overwatering does not occur. ***Describe below how the amount of water you apply is adapted to meet the moisture deficit of the soil:*** *(e.g. sprinkler sizes, timers, return period, speed, VRI etc)*		Information provided. Visual observation
Irrigation run-off is a significant risk on the North Otago Downlands due to the rolling topography and slowly draining Pallic soils. Identify the areas on your property with high run-off risk and manage these areas to mitigate the risk. Include these risks in an Irrigation Management Plan – see Target 3.2 below. Risk factors include steep slopes, compaction, gullies, etc. Run-off must not leave the boundary of your property.		Farm mapping Information provided. Irrigation Management Plan. Discussion. Visual observation.

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
2.2 Irrigation Decisions		
Irrigation applications are based on soil moisture status, monitored using an objective soil moisture monitoring tool (e.g. permanent sub-surface tapes and probes, hand-held probes, etc) **OR** a soil water budget. If you wish to use a soil water budget, DairyNZ has a good soil water budget template which you can download at: https://www.dairynz.co.nz/media/5759907/dairynz-soil-moisture-trace.xlsx You can access ET from the Windsor weather station at Windsor (orc.govt.nz) ***Record what method is used in the space below:***		Irrigation, rainfall and soil moisture records. Water budget. Discussion of irrigation practices. Software-based evidence. NOIC water use efficiency data.  **TIP:** Log into the NOIC shareholder portal to access your water use efficiency data. This compares your monthly water use with other operations of the same type. Shareholders - North Otago Irrigation Ltd (noic.co.nz)
Records of all monitoring and irrigation applications are kept to demonstrate that soil moisture levels are managed between field capacity and refill point.  **TIP:** NOIC has a recording template available on the website if you wish to use it – you can modify it to suit your own particular system. Environmental Management - North Otago Irrigation Ltd (noic.co.nz)		
Irrigation application and rotation are adjusted based on weather events and climatic information. Rainfall records are kept and rainfall forecasts are monitored and used in decision making.		
Soil temperature is monitored and recorded at the start of the season and used in decision making.  **TIP:** Wait until soil temperature is at least 10 ^{o}C at 10 cm depth at 10 am to start irrigating or you simply limit growth.		Soil temperature records

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 3: The performance of irrigation systems is regularly assessed, and irrigation systems are maintained and operated to apply irrigation water at their optimal efficiency.		
3.1 System Assessment		
Check that the irrigation system is applying the correct amount of water at least once every three years and keep records.  **TIP: Bucket Tests** Consider doing 1/3 of your system each year so you check the whole system over three years. Use the template on the NOIC website or download the "Check-it Bucket Test" App from your App store. Bucket tests may not suit with VRI pivots- a rain gauge on a standard at various locations & verified back to known programmed application rate at that location may be suitable		Bucket tests or system evaluation by a qualified provider.
Any irregularities resulting from evaluation or bucket test are fixed.		Discussion.
3.2 Operation		

An Irrigation Management Plan has been developed for the property, that includes:
• Irrigation risk areas are identified, and any specific management steps required to mitigate these risks are recorded.
• Maintenance checklist (pre-season and during season) and records (See Irrigationnz.co.nz)
• Daily operating procedures, including
  ○ Check weather forecast
  ○ Recording:
  – Rainfall
  – Application
  – Soil moisture monitoring (trigger points identified)
• End of season shut down procedure
• Incident procedures and recording
		Irrigation Management Plan
		Farm mapping
		Discussion
		Visual observation.

K-line shifts are made to a suitable plan (e.g. GPS on bike or markers).		
Where possible, K-line are positioned with pods running across the slope rather than in a line from top to bottom to minimise accumulated run-off.		
Establish minimum distances that irrigation system must be from any watercourses running through the property to ensure no direct application or runoff to watercourses is occurring.		

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Application to non-productive areas (e.g. tracks, impermeable surfaces, drains) is minimised.		
When using centre pivots, be careful where the pivot tracks over laneways. If runoff via the laneway is observed, take steps to prevent it continuing – e.g. VRI.		
Ensure irrigation water does not drift onto the road. This is both annoying and dangerous - you will be liable if a loss of traction incident occurs. Be particularly careful with pivot end guns in high wind.		
Consider the differences in water requirements due to aspect and slope and manage irrigation accordingly, e.g. apply less water to shady faces.		
Irrigate with conservatively in the shoulder seasons - low ET = low water demand. Save space for rain and do not cool soil.		
3.3 Maintenance		
Daily checks for blocked nozzles, damaged hydrants, split hoses, excessive runoff or ponding, etc. If any problems are identified, shut off system and fix. Incident records are kept.		Incident records.
Pre-season checks are undertaken on all irrigation equipment. Check for leaks/blockages on first start up and subsequent starts for first week. http://www.irrigationnz.co.nz/PracticalResources/IrrigationDevelopment/StartUp		Maintenance records. Service invoices.
Regular maintenance of the irrigation system is undertaken throughout the season, as identified in Irrigation Management Plan. Pivots should be serviced annually.		Maintenance records. Service invoices.
Target 4: Staff are trained in the operation, maintenance and use of irrigation systems		
Staff with irrigation management duties are suitably trained with respect to their responsibilities.		Staff training records (signed). Training material
There are written operation and maintenance procedures for staff to follow.		Irrigation Management Plan. Operation manuals available.
Staff with responsibility for irrigation scheduling have attended relevant training such as the NOIC irrigation manager training, the online Irrigation New Zealand Irrigation Operator and Manager Training (contact NOIC for details), or similar industry training.		Training records, certificates.

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Additional Comments:		

Risks and Actions		
Risks *Summarise the irrigation management risks associated with the property. These may arise due to the physical farm environment, the infrastructure you have or the personnel doing the work.*	**Planned Action** *List any further actions that are required to avoid, remedy or mitigate the identified risks or to meet the GMPs required above.*	**Timeframe** *If additional work is required, when will this be done?*

Section 3: Nutrient Management

Objective: *Manage nutrient inputs to match plant requirements and minimise nutrient losses to water. Do not exceed any consented limits or regional rules.*

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 1: All sources and potential losses of nutrients are clearly identified		
All properties must as a minimum use an annual predictive nutrient budget using an approved method based on soil tests to inform fertiliser applications.		Nutrient budget. Soil test results.
~~All properties with more than 50 ha of irrigation must have a year-end "Actual" nutrient budget prepared by a Certified Nutrient Management Advisor in accordance with Overseer data input standards at least once every three years.~~ Note: due to the Overseer review being undertaken by the Government, NOIC is not requiring a year end nutrient budget using Overseer.		~~'Actual' nutrient budget must be available at audit.~~ ~~*Note that alternative methods, as specified in the Glossary, are also accepted*~~ Actual budgets if you have them otherwise a predictive nutrient budget will suffice
Critical Source Areas for phosphorous and sediment loss are marked on a farm map – including risk areas for run-off, compaction and erosion.		Farm map showing critical source areas.
Target 2: Farm practices minimise nutrient losses		
Fertiliser is applied to Spreadmark standards if spread by a contractor or with suitably calibrated equipment if spread by farm owner / operator (calibration specific to product).		Spreadmark accreditation or calibration procedure. Proof of placement maps from GPS.
A buffer is maintained around all watercourses and critical source areas when spreading fertiliser (at least 3 metres).		Proof of placement maps from GPS. Farm map showing watercourses and critical source areas.
The nutrient budget is understood and is used as a key on-farm management tool. • Actual fertiliser application rates are consistent with the nutrient budget. • Scenarios to reduce N loss have been explored.		Discussion of nutrient budget. Fertiliser application records.
Nitrogen applications do not exceed 190kg N/ha/yr (excluding crop) – as per the National Environmental Standard. *Note that this applies to any individual paddock, regardless of whether the whole farm average is under 190 kg N /ha/yr.*		Fertiliser application records.
Monitor soil phosphorus levels and maintain them at or below the agronomic optimum for the farm system.		Soil test results.
Use several small applications of fertiliser during the growing season: • Pasture - apply a maximum of 50 kg N/ha and 100kg P/ha in any one dressing • Cropping - apply a maximum of 80kg N/ha in any one dressing		Fertiliser application records.

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Fertiliser is not applied when soils are at field capacity or to severely compacted soils.		Fertiliser application records and soil moisture records.
Nitrogen application rates are adjusted on effluent blocks to take account of the nitrogen in effluent and the nutrient budget reflects this.		Nutrient budget. Fertiliser application records.
Nitrogen is not applied when the 10cm soil temperature at 9am is less than 6 °C.		Fertiliser application records and soil temperature records.
Pasture is at least 25mm high (approx 1000kg DM/Ha) before nitrogen is applied.		Fertiliser application records and pasture records/diary notes.
Store and load fertiliser to minimise the risk of spillage, leaching and loss into watercourses.		Field inspection.
GHG emissions are reduced through consideration of nitrogen fertilizer rates and products used.		Nutrient budget.
Target 3: All potential point source discharges are appropriately managed		
Silage pits are constructed, made and managed where there is no risk of contamination to groundwater or surface water.		Field inspection.
Offal pits are located in areas where there is no risk of contamination to groundwater or surface water and are constructed as per Regional Council rules.		
Farm rubbish dumps are located in areas where there is no risk of contamination to groundwater or surface water and are not used for disposal of hazardous materials.		

Additional Information Required:

Record your N loss figure: **Record your GHG number:**

List fertiliser products used and application rates:

Describe your spreading practices:

Risks and Actions

Risks *Summarise the nutrient management risks associated with the property. These may arise due to the physical farm environment, the infrastructure you have or the personnel doing the work.*	**Planned Action** *List any further actions that are required to avoid, remedy or mitigate the identified risks or to meet the GMPs required above.*	**Timeframe** *If additional work is required, when will this be done?*

Section 4: Soil Management

Objective: *The physical and biological condition of soils is maintained or improved to minimise the movement of sediment, phosphorus and other contaminants to waterways.*

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 1: Farming activities are managed so as to not exacerbate erosion.		
Direct drilling and/or minimum tillage cultivation techniques used where there is a risk of erosion or sediment run-off.		Field inspection. Evidence of technology use.
After cultivation paddocks are sown as soon as possible to reduce sediment loss or cover crops are used.		Discussion.
Check regularly that erosion resulting from irrigation (e.g. under runners, wheel rut channeling) is not occurring and take remedial action if found.		Field inspection. Farm mapping.
Any other areas of erosion on the property, including stream banks, are identified and appropriate management applied. This may include excluding stock and planting of erosive areas.		Farm mapping. Diary notes. Visual observation.
Target 2: Soils are well-managed to optimise infiltration of water into the soil profile and minimise run-off of water, sediment loss and erosion.		
Recognise soil compaction risks and take management steps to minimise soil compaction damage, such as: • Grazing before irrigation so soil is at its driest • Using designated 'safe areas' or on/off areas for cattle grazing • Shifting cattle regularly or breaking up mobs to avoid excessive pugging • Limiting the passage of heavy machinery • Using a feed pad or stand-off area • Designating a sacrifice paddock (avoid paddocks where runoff will enter waterways)		Discussion. Farm mapping. Diary notes.
Check for soil compaction annually (late spring ideal) and if necessary, use aerator/subsoiler or alternative method to alleviate the problem.		Field inspection. Compaction inspection records/diary note. Discussion / soil aeration records.
Where significant soil compaction has been identified; reduce irrigation, effluent and fertiliser application accordingly.		Irrigation, effluent and fertiliser application records.
Soil health is considered through farming practices such as stubble incorporation and other methods.		Discussion.

Any Additional Comments:

Risks and Actions		
Risks *Summarise the soil management risks associated with the property. These may arise due to the physical farm environment, the infrastructure you have or the personnel doing the work.*	**Planned Action** *List any further actions that are required to avoid, remedy or mitigate the identified risks or to meet the GMPs required above.*	**Timeframe** *If additional work is required, when will this be done?*

Section 5: Dairy Effluent Management

Objective: *Animal effluent and solid animal waste is managed to minimise nutrient leaching and run-off.*

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 1: Effluent system and effluent application are fully compliant with regional rules.		
Effluent system and application are fully compliant with Otago Regional Council rules. The key rules are: • No spreading of effluent occurs: ○ over any drain or water race ○ within 50 m of any lake, river, wetland, bore or soak hole ○ to saturated land or where it results in ponding or overland flow to a waterway ○ within 20 m of a formed public road ○ within 150 m from any residential dwelling or building used for employment purposes on a neighbouring property ○ within 150 m from any public amenity area or place of public assembly. ○ There is no discharge to land when the soil moisture exceeds field capacity ○ Operated in accordance with an effluent management plan that meets Otago Regional Council requirements (refer to Schedule 21 in the Otago Regional Council's Regional Plan: Water) • Odours must not be offensive or objectionable beyond your farm boundary. • Outdoor stockpiles of material like waste animal bedding and manure must be more than 150 m from your farm boundary.		Otago Regional Council compliance inspection reports. Supplier inspections. Effluent Management Plan Effluent application map - check features and exclusion zones.  **TIP:** If you inject effluent into a pivot to be spread with irrigation water, you must meet the setbacks specified under Target 1, regardless of the low concentration.
Target 2: Sufficient and suitable storage is available to enable animal effluent and wash-down water to be stored when soil conditions are unsuitable for application.		
2.1 Storage System Design		
Sufficient effluent storage capacity is available to ensure that effluent does not need to be applied when soil conditions are at or near field capacity.		DESC Calculation. Site inspection.
Effluent storage facilities are sealed to prevent contamination of surface or groundwater and a drop test has been done to prove this.		Site inspection. Drop test.
All effluent from dairy sheds, yards, feed pads and other collection areas is collected for land application.		Site inspection.
Effluent solids are stored and contained on an impermeable surface, with liquid run-off diverted to effluent storage.		Site Inspection.
Any new collection, storage and treatment systems for effluent are designed to industry Codes of Practice (or equivalent standard) and Otago Regional Council rules.		Certificate from a suitably qualified person

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
2.2 Storage Management		
Storage is actively managed to keep pond as low as possible and pond level is checked daily. Pond level should be low going into the shoulder seasons to ensure you have storage capacity available for the wetter months or busier times of the year, such as spring.		Pond Level Effluent application records
Ponds are managed to ensure solids are not accumulating and pond is not becoming anaerobic.		Site Inspection.
There is no emission of objectionable odour and no odour complaints have been made.		Site inspection.
Minimise the amount of extra water going to storage by diverting roof water and diverting yard water during the non-milking part of the year.		Site inspection.
Use efficient wash down methods to reduce the amount of effluent you have to store and manage. This may include systems such as a scraper, the use of greenwater washdown, etc.		Site Inspection.
Target 3: The timing and rate of application of effluent and solid animal waste to land is managed so as to minimise the risk of contamination to groundwater or surface water.		
3.1 Application Depth and Rate		
The effluent irrigation system is capable of delivering the correct amount of effluent for soil type and slope.		System specifications.
An effluent application map and record of all effluent applications and any incidents are kept.		Effluent application map and records.
Effluent is applied at depths/rates that do not lead to ponding, runoff or leaching. Low-rate effluent application (< 10mm/hour) is preferrable in the North Otago Downlands.		System specifications. Effluent application map and records.
Effluent application is based on soil moisture status and effluent is not applied to saturated soils.		Records showing soil moisture monitoring is an integral part of effluent management.
Check effluent application depth and uniformity at least once annually and keep records.		Bucket test.
3.2 Application Area		
Effluent irrigation area is adequate for storage and number of cows - at least 8 ha/100 cows.		DESC.
Effluent block is large enough to ensure N loss mitigation.		Nutrient budget.
Effluent is not applied to CSAs or other risk areas.		Farm mapping.
Soil type is considered when spreading effluent.		Farm mapping.
3.3 Operation and Maintenance		

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
An Effluent Management Plan is prepared for the property, including: • All potential effluent system risks are identified and mitigated. • Daily operating procedures • Incident procedures • Maintenance procedures  **TIP:** Schedule 21 of Otago Regional Council's **Regional Plan: Water** lists the minimum requirements for a management plan. DairyNZ or your Milk Supply Company can support you to prepare an Effluent Management Plan. Managing and operating effluent systems - DairyNZ		Effluent Management Plan, including written procedures.
Regularly service and check all equipment. Ensure equipment for spreading effluent and other organic manures is calibrated.		Maintenance Records.
Take immediate action if an incident or breakdowns occurs including: • shut off effluent application • rectify the problem • clean up if possible • take action to minimise the risk of it occurring again.		Incident records.
Use fail-safe technology to minimise risk of incidents and prevent application of effluent to high-risk areas.		Discussion & visual observation.
Target 4: Staff are trained in the operation, maintenance and use of effluent storage and application systems.		
Staff who are involved in the management of the effluent system are fully trained in the use of the system.		Staff training schedule. Staff training material.
Additional Information Required:		

Peak cows milked: **DESC Calculation:** **Effluent Area:** **Days Storage:**

Describe effluent storage system: *e.g. solid separation, etc*

Describe application system: *e.g. method/depth /rate*

Describe key operational procedures: *e.g. strategies when soil saturated and pond full e.g. intermittent pumping 30 minutes on, 30 minutes off.*

Risks and Actions		
Risks *Summarise the dairy effluent management risks associated with the property. These may arise due to the physical farm environment, the infrastructure you have or the personnel doing the work.*	**Planned Action** *List any further actions that are required to avoid, remedy or mitigate the identified risks or to meet the GMPs required above.*	**Timeframe** *If additional work is required, when will this be done?*

Section 6: Watercourse and Critical Source Area Management

Objective: *Wetlands, riparian areas and the margins of surface water bodies 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.*

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 1: Stock are excluded from watercourses in accordance with NOIC policy, National Environmental Standards, regional council rules or any granted resource consent.		
1. All beef cattle, dairy cattle, dairy support cattle, deer and pigs are excluded from **flowing or intermittent watercourses**, wetlands and any Critical Source Areas (where there is water). 2. All stock must be excluded from areas with known mahinga kai values.		Farm mapping. Field Inspection.
During wet periods use electric fencing to temporarily exclude stock from wet areas of paddocks, where there is a risk that contaminated water could enter a watercourse.		Discussion, diary notes and photos.
During Intensive Winter Grazing, the critical source area must not be grazed; and vegetation must be maintained as ground cover over all of the critical source area; and maintaining that vegetation must not include any cultivation or harvesting of annual forage crops. This includes activities on a farm that support intensive winter grazing and may occur year-round, such as the preparation and sowing of land for grazing and the cultivation of annual forage crops		Farm mapping Winter grazing plan
Target 2: Vegetated riparian margins of sufficient width are maintained to minimise nutrient, sediment and microbial pathogen losses to watercourses.		
Maintain a vegetated riparian buffer strip around all watercourses and wetlands when excluding stock. Buffer strips are to be of sufficient width to adequately filter any run-off – a 3 metre setback from the edge of the bed of a river or lake should be applied.  **TIP:** The steeper the slope, the faster water will run off it and therefore the greater the width of the buffer that should be provided. Leave buffers un-grazed – long grass is a great filter. A riparian planting programme will further enhance biodiversity values and is considered premium practice.		Farm mapping. Field Inspection. *Optional – Riparian Planting Plan.*
Where winter grazing of forage crops will occur, riparian buffers must be at least 5m in width.		Intensive Winter Grazing Plan.

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 3: Farm tracks, gateways, water troughs, stock camps, wallows and other farming activities that are potential sources of sediment, nutrient and microbial loss are managed so as to minimise the risks to surface water quality.		
All watercourse crossings for dairy cows and deer have a bridge or culvert. Ensure effluent from the crossing cannot enter the watercourse. All watercourse crossings for beef cattle are either bridged or culverted in irrigated areas.  **TIP:** Old concrete fence posts/power poles on the upstream and downstream edge of the crossing will reduce the amount of muck entering watercourses.		Farm mapping. Field Inspection.
Runoff water from tracks and crossings is intercepted and diverted on to paddocks or filtered through a riparian buffer prior to discharge.		Field Inspection.
Target 4: Biodiversity and cultural values are protected and enhanced		
All sites of indigenous vegetation on the property are identified and protected, e.g. through fencing and pest control to manage plant and animal pests.		Farm mapping.
All Rock Art sites on the property are identified and protected, e.g. stock exclusion and irrigation management to prevent any damage.		Farm mapping.

Risks and Actions		
Risks *Summarise the watercourse and CSA management risks associated with the property. These may arise due to the physical farm environment, the infrastructure you have or the personnel doing the work.*	**Planned Action** *List any further actions that are required to avoid, remedy or mitigate the identified risks or to meet the GMPs required above.*	**Timeframe** *If additional work is required, when will this be done?*

Section 7: Intensive Winter Grazing Management

Objective: *To minimise the risk of nitrogen, phosphorous, sediment and other contaminant loss to waterways and mitigate any adverse effects on soil condition as a result of Intensive Winter Grazing.*

Intensive Winter Grazing means grazing livestock on an annual forage crop at any time between 1 May and 30 September of the same year.
Annual forage crop means a crop, other than pasture, that is grazed in the place where it is grown.

From 1 November 2022, under National Environmental Standards, Intensive Winter Grazing is a permitted activity if the following conditions are met:

- at all times, the area of the farm that is used for intensive winter grazing must be no greater than 50 ha or 10% of the area of the farm, whichever is greater BUT land on the farm must have been used for intensive winter grazing in the reference period (which is between 1 June 2014 and 30 June 2019); and at all times, the area of the farm that is used for intensive winter grazing must be no greater than the maximum area of the farm that was used for intensive winter grazing in the reference period.
- the slope of any land under an annual forage crop that is used for intensive winter grazing must be 10 degrees or less, determined by measuring the slope over any 20 m distance of the land
- livestock must be kept at least 5 m away from the bed of any river, lake, wetland, or drain (regardless of whether there is any water in it at the time);
- the critical source area must not be grazed; and vegetation must be maintained as ground cover over all of the critical source area; and maintaining that vegetation must not include any cultivation or harvesting of annual forage crops
- to take all reasonably practicable steps to minimise adverse effects on freshwater of any pugging that occurs on that land.
- vegetation to be established as ground cover as soon as practicable after livestock have finished grazing the land

A resource consent from Otago Regional Council will be required if these conditions cannot be met.

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 1: Compliance		
Intensive Winter Grazing is compliant with Regional Rules and National Environmental Standards		Resource Consent (if applicable).
An Intensive Winter Grazing Plan, including a map, has been prepared before grazing commences and incorporates the GMPs outlined below. *Note that this section of your FEP can be used as your Intensive Winter Grazing Plan or you can use any industry template.*		Intensive Winter Grazing Plan.

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
Target 2: Paddock Selection and Risk Assessment		
Where possible, select paddocks that do not: • Contain soils that are vulnerable to leaching, pugging and compaction. • Contain watercourses and CSAs. • Have significant artificial drainage via mole and tile drains.  **TIP:** Heavy soils are at greater risk of pugging, compaction and structural damage. Light soils are prone to leaching. Consider only grazing lighter classes of stock on heavy soils during winter grazing.		Discussion and visual observation. Intensive Winter Grazing Plan
If the above paddocks are unavoidable, ensure management is in place to mitigate risks.		Intensive Winter grazing Plan.
Target 3: Cultivation and Set-up		
Use minimum tillage practices to sow winter crop, except where renovation is necessary.		Discussion and visual observation.
Cultivation occurs across the slope where it is safe to do so. Crop rows will act as mini buffers, catching soil when it travels down the hill.		
In paddocks with watercourses or CSAs, ensure a buffer of at least 5 metres in width is left in grass when sowing the crop.		
Set up baleage/hay in paddocks ahead of winter to reduce the amount of time heavy machinery is used on a paddock once it is wet. Keep baleage/hay placement away from watercourses, CSAs and wet areas.		
Target 4: Grazing Management		
Grazing occurs in accordance with the Intensive Winter Grazing Plan.		Discussion of grazing practices. Intensive Winter Grazing Plan. Photographic evidence from previous season.
All watercourses and CSAs have a 5 metre vegetated buffer that is left un-grazed.		
If necessary, additional mitigation measures such as straw bales or sediment traps are placed in low spots to filter any runoff to watercourses.		
Use portable water troughs and portable feeders for supplemental feed to reduce movement of animals and damage to soils. These are moved with the breaks and kept away from any watercourses, CSAs or wet areas.		
Use strategic directional grazing - on a sloping paddock, fence across the slope and graze from the top to the bottom. That way the standing crop acts as a filter. Strips next to watercourse buffers are grazed last.		
Use back fencing to prevent stock access to the grazed breaks. This helps to minimise pugging damage and reduces the risk of run off from bare, recently grazed soil.		

Required Practices	✓ or N/A	Evidence for Compliance / Records Required
There is a contingency plan for adverse weather. This may include: • Splitting the mob into multiple groups to reduce grazing density. • On/off grazing using a stand-off area, e.g. a designated grass run-off paddock or a wintering pad. • Shift stock more than once a day with small breaks before soil begins pugging. • Increase amount of supplementary feed and feed out in less vulnerable areas.		
Target 5: Post Grazing Management		
Cultivation and/or aeration practices are chosen based on post grazing paddock condition.		Discussion and visual observation.
Test soil prior to the next crop being planted and adjust fertiliser requirement to capture the soil supply of nitrogen OR plant a catch crop to utilise excess nutrients, such as short season cereals.		Soil tests. Discussion and visual observation.
Re-sowing as soon as practical.		Discussion and visual observation.
Additional Information Required:		
Total ha in forage crop: **Crop Types and ha:** **Describe how paddocks are selected:** **Describe cultivation and set-up:** **Describe grazing management:** **Describe post-grazing management:**		

TIP: Check out the Ministry for Primary Industries website for tips on intensive winter grazing https://www.mpi.govt.nz/dmsdocument/44866-20212022-Intensive-Winter-Grazing-Module and the Otago Regional Council winter grazing plan template https://www.orc.govt.nz/media/12304/updated-iwg-paddock-plan-template.pdf
Have your completed winter grazing plan available for your auditor