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What is the responsible dairy conversion guide about?

Planning and implementing a dairy conversion is a massive undertaking. There are many decisions to make, which will underpin the farm’s future performance. This booklet provides guidance around some of the environmental aspects and considerations when planning a dairy conversion.

This guide is for farmers and people who work with farmers who are considering a land use conversion to dairy farming.

When it comes to farming, there are no one-size-fits-all environmental solutions and the dairy industry is working hard to make sure farmers continue to have the freedom to choose the best option for their own business, while meeting community and consumer expectations.

**Responsible dairy conversion is about striving to be good dairy industry ambassadors, while setting up a successful and sustainable business.**

There is growing scrutiny of dairy farming around New Zealand and the industry recognises that community expectations around responsible dairying need to be at the forefront of dairy business planning, including new conversions.

As part of the industry’s commitment to New Zealanders under the Sustainable Dairying: Water Accord, all new conversions must meet the Sustainable Dairying: Water Accord targets right from the start. This guide will help you through this process.

We don’t expect everything suggested in this guide will work for every farmer and every farm. The intention is to assist farmers with their information gathering and decision-making about the suitability of land for conversion to dairy farming. It also offers suggestions for how farmers may manage the conversion to achieve industry good practice and future-proof their business.

What is included in the responsible dairy conversion guide

<table>
<thead>
<tr>
<th>What’s covered</th>
<th>What’s not covered in this guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>This guide covers the farmer’s responsibilities for the environmental, animal and people considerations during a conversion. This includes:</td>
<td>It does not cover the financial, productivity or lifestyle aspects of the decision to convert to dairy farming. It also does not cover the ‘how to’ or the ‘why’ aspects of the good practices suggested in the guide. This includes:</td>
</tr>
<tr>
<td>• the importance of responsible dairying for the industry</td>
<td>• the best practice design or construction of farm infrastructure such as tracks and races, feed pads, off-pasture facilities and effluent systems</td>
</tr>
<tr>
<td>• the types and sources of information which may affect the conversion process and the suitability of land for dairy use</td>
<td>• the mechanics and science behind why the suggested practices or actions work</td>
</tr>
<tr>
<td>• incorporating responsible dairying considerations in conversion plans</td>
<td>• details such as the types of plants to choose for riparian planting, where to find them and how to manage and care for them.</td>
</tr>
<tr>
<td>• a template and list of actions which should be considered in the planning and implementation of a responsible conversion.</td>
<td>Many of the relevant ‘how to’ resources available are highlighted in this guide.</td>
</tr>
</tbody>
</table>
Competitive and responsible dairying – our industry’s challenge

‘New Zealand’s dairy industry has expanded rapidly in recent times. As cow numbers and production have increased, general trends show that our environmental footprint has also increased.

‘The industry’s strategic vision is ‘dairy farming working for everyone’. To achieve this vision, dairy farming must be competitive and responsible. Defending and enhancing New Zealand dairy farming’s competitive advantage is a continued effort, building on previous strategies and focusing on the key areas that make a difference to the economic performance of dairy farming.

‘Dairy farming must also address its responsibilities inside and outside the farm gate. A responsible dairy farming industry is one which demonstrates good stewardship of resources, acknowledges its duty of care to people and animals, and which builds a better New Zealand through the contributions of farmers and the wider industry to New Zealand society. Meeting these objectives will create a more sustainable future for dairy farming in New Zealand.’

Strategy for Sustainable Dairy Farming 2013-2020
To protect our future, the dairy industry has made a commitment to take all practical steps to mitigate adverse effects to water quality, from both existing dairy farms and any new farm conversions. The Sustainable Dairying: Water Accord was released in 2013 and picks up on the successes of the previous accord to work towards the industry strategy. A commitment for new dairy conversions to implement good practice is an important first step.

"New dairy farms establish and operate using good practice at the outset to minimise potential negative consequences on water values and interests."

Sustainable Dairying: Water Accord – A Commitment to New Zealand by the Dairy Sector. July 2013

The benefits of good environmental stewardship are numerous to both the industry and the wider community. Benefits include:

- continued freedom to farm in a way that meets the lifestyle and business needs of farmers
- a profitable and enduring industry which will continue to attract new generations of farmers
- reduced further increases in compliance and monitoring costs for farmers, rate and taxpayers
- improved dairy industry reputation within the wider community
- value-add in New Zealand product marketing overseas
- maintaining the dairy industry’s position as an economic powerhouse in New Zealand
- maintaining and improving the environment for the community’s benefit.
Where to start…

Ways of integrating good environmental practice into the conversion planning process is broken into three stages.

1. **The information gathering stage.**
   This is very early in the conversion process when the due diligence is occurring.
   The types of relevant information include:
   a. the district and regional council requirements
   b. dairy company requirements
   c. any others which may be of influence, such as irrigation schemes.

   It is very important to have discussions with all these organisations very early in the conversion process, to ensure your planning sets off down the right path, potentially saving a lot of cost and effort. Approaching these organisations early on and establishing a positive working relationship with them can reap rewards at later stages.

2. **The planning stage.**
   Now is the time to integrate the environmental considerations into the whole farm planning stage.
   This includes:
   a. creating the farm goals, policies and procedures documents
   b. determining the layout and design of buildings, paddocks, raceways etc
   c. creating nutrient budgets, effluent, riparian, nutrient management and wintering plans.

   Integrating environmental planning in the planning stage can make the task a whole lot easier. For example, using GPS mapping to locate environmental risk areas, exclusion zones and buffer zones on the farm, can help inform the farm and effluent system design stage. There are several farm management software tools and ‘cloud-based’ systems which can help achieve regulatory compliance, reporting and generally meeting good management practice aspirations and targets.

3. **Implementation.**
   Now is the time for action. Now the conversion activities such as earthworks, construction and riparian fencing can go ahead with confidence, taking all of the environmental considerations into account. Planning around the climate and seasons, where possible, can reduce the impact on surface water quality (i.e. earthworks in the summer).
**Information gathering**

**What are the regulatory requirements for this property?**

There are environmental requirements from a number of sources which must be taken into account during the planning stage. They include, but are not limited to:

- regional councils
- district councils
- dairy company terms and conditions of supply
- irrigation schemes.

**District and regional councils**

The best people to talk to at district and regional councils are the planners and land management staff. It’s always a good idea to talk with senior planning and land management staff first, as they should have a broad understanding and will have dealt with dairy conversions before.

- Check for any noted features on the property which may need to be managed (e.g. regionally significant wetlands or archeologically significant sites).
- Talk about the potential location for infrastructure (e.g. buildings, water bores, effluent storage, driveways/entry and exit points). Consider future-proofing your conversion by placing buildings to allow for future expansion, if this may be likely.
- Consider any potential underpass sites.
- Note all the minimum distances for the placement of buildings, facilities and activities such as effluent storage and application.
- Note any requirements around change of land use and the rules for activities such as earthworks, building, work around waterways, irrigation, water takes, effluent management, nutrient management etc.
- Discuss consent and application processing timeframes, and get in early to avoid hold-ups and delays during critical times in the conversion.
- Ask about any relevant plan changes or variations to the regional or district council plans that are underway. Regional councils are currently implementing the National Policy Statement for Freshwater Management. This requires councils to set limits on water quality and quantity by 2030. You need to know where the council is at in this process and how it might affect your dairy farm business in the future.
**Dairy companies**

- Obtain a full list of terms and conditions of supply from your prospective dairy company.
- Note any significant application deadlines.
- They may have an environmental advisor or new conversion manager who can help you work through some of the conversion requirements and point you in the direction of other helpful resources.

The regulatory conditions from the Food Safety Authority of New Zealand are included in the terms and conditions of supply provided to farmers by each dairy company. These standards and any other dairy company requirements are independently audited on each farm annually.

*DPC2: Animal Products (Dairy) Approved Criteria for Farm Dairies:*

www.foodsafety.govt.nz (search ‘DPC2’).

*Dairy - NZCP1: Design and operation of farm dairies - Code of practice:*

www.foodsafety.govt.nz (search ‘NZCP1’).

**Irrigation schemes**

- Be sure to discuss your intentions to convert to dairy with the irrigation scheme provider, some schemes have limitations on land use imposed as part of their consent.
- Most irrigation schemes will have a requirement for an environment plan.
Nationally consistent standards

For future-proofing your investment in farm infrastructure and to achieve good practice, DairyNZ recommend the following practices as a minimum in every region, for new conversions.

- Have your effluent system and storage sized, designed and installed by an accredited effluent company. A full list of qualified design companies is available at www.effluentaccreditation.co.nz.

- Size the effluent application area using the Overseer nutrient budget tool, to fall within acceptable nitrogen application rates. For efficient use of nutrients and to minimise losses from the farm system, develop a nutrient budget and nutrient management plan for the farm with a certified nutrient management advisor (www.nmacertification.org.nz/site/nutrient_management/).

- Develop a farm environment plan, which should be integrated into your whole farm plan (i.e. business plan. Visit www.dairynz.co.nz/people (grow your people > involving your people).

- DairyNZ has developed the Sustainable Milk Plan as a simple template for an environmental plan (for more details visit www.dairynz.co.nz/smp). Note: there is a wide range of environmental plans out there, but the key to a good plan is considering all your options and a list of agreed actions that, when implemented, will achieve your objectives.

- Be strategic about the design and placement of infrastructure and utilities around the dairy. Good practice is to design the layout for all of these, allowing room for future expansion, even if they are not yet required. Allowing for and linking all of these to the effluent system, and being able to utilise natural landscape, will make effluent management much easier in future.

  Focus areas include:
  o stock housing, feeding or standoff areas
  o the dairy and yard, high-use laneways/yard entry and exit points
  o feed storage facilities, including silage pads and bunker
  o effluent storage and management facilities.

  These areas should also be sealed to capture nutrient losses and, if requiring a building consent, certified by a chartered professional engineer holding a current practicing certificate.

Tip: don’t bury old fencing materials – recycle! Old fence posts can have many purposes in a conversion. Examples include using concrete posts as supports and foundations for culverts and small bridges, small retaining walls, protection for pipework at junctions and under tracks and races. Wire may be recyclable for scrap metal.
District and regional council rules and requirements

Many activities involved in a dairy conversion have rules or controls around them, so it is wise to get in touch with the regional and district council in the early stages of conversion planning.

Activities which are typically monitored and/or controlled by a regional or district council include:

- effluent management
- water use and water takes
- earthworks
- contouring land
- draining land or altering a waterway or wetland
- construction of ponds or dams
- stock crossing points on waterways (culverts or bridges)
- underpasses
- offal and rubbish management
- silage and other feed storage areas
- animal housing, loafing or stand-off areas.

Houses will also need building consents, including approval of any septic/wastewater disposal.

Councils are responsible for enforcing The Resource Management Act (1991), which allows for six types of activities, shown below.

<table>
<thead>
<tr>
<th>Type of activity</th>
<th>Requires resource consent</th>
<th>Must be granted consent</th>
<th>Can be granted consent</th>
<th>Can restrict matters to be considered</th>
<th>Must have effects which are minor or consistent with plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permitted</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Controlled</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Restricted discretionary</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Discretionary</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Non-complying</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Prohibited</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Regional council conversion requirements

After a period of significant conversion to dairying, some regional councils have brought in land use change requirements, in addition to the controls placed on farming activities, such as effluent management. The primary purpose of these requirements is to minimise the loss of nutrients into catchments and prevent a decline in water quality.

The following table lists the regional council’s activity status for effluent management (permitted activity [PA] or controlled activity, requiring resource consent [RC]), as well as summarising any requirements specific to new dairy conversions.

Please note: the information provided here may be subject to change – for the latest conversion requirements contact the relevant council direct.

In addition to any requirements listed here, you will still need to follow all rules for the activities listed on the previous page.

Table one: controls on effluent management and a summary of any new conversion requirements by region.

<table>
<thead>
<tr>
<th>Council region</th>
<th>Effluent management</th>
<th>Additional conversion requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northland</td>
<td>Discharge to land a PA.</td>
<td>No specific rules for conversions.</td>
</tr>
<tr>
<td></td>
<td>Discharge to water with a RC.</td>
<td></td>
</tr>
<tr>
<td>Auckland</td>
<td>Discharge to land a PA.</td>
<td>The Proposed Auckland Unitary Plan comes into effect immediately for new dairy farms.</td>
</tr>
<tr>
<td></td>
<td>Discharge to water with a RC.</td>
<td>The key changes are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adequate effluent storage facilities must be in place from the time of conversion (sized by the Dairy Effluent Storage Calculator). It must have certification from a chartered professional engineer holding a current practicing certificate, must demonstrate adequate storage volumes and the permeability must not exceed $1 \times 10^{-9}$ m/s. Certification must be submitted to the council within 30 days of completion of the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stormwater diversion must be in place to direct stormwater from ancillary roof areas and hardstand areas not used to hold animals or animal products, away from the effluent system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Feed pads, permanent stand-off areas and silage storage facilities must be situated on a sealed pad, have certification from a chartered professional engineer holding a current practicing certificate and must demonstrate that the permeability does not exceed $1 \times 10^{-9}$ m/s. Effluent, leachate and runoff must be captured and managed in an effluent system, and managed in a manner which meets permitted activity rules.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Silage facilities must be securely covered to exclude stormwater.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Silage storage facilities, offal holes and offal trenches must not be located within 20 m of a surface waterbody, floodplain or the coastal marine area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• An Overseer nutrient budget is required to be used to plan effluent application and meet maximum nutrient application limits on specified soil types. Maximum nitrogen (N) application limits include all sources of N (effluent, fertiliser etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Auckland Council Regional Plan: Air, Land and Water</td>
</tr>
<tr>
<td>Location</td>
<td>Discharge to land</td>
<td>Discharge to water</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>Waikato</strong></td>
<td>Discharge to land</td>
<td>Discharge to water</td>
</tr>
<tr>
<td><strong>Bay of Plenty</strong></td>
<td>Discharge to land</td>
<td>Discharge to water</td>
</tr>
</tbody>
</table>
| **Hawke’s Bay**   | Discharge to land | Discharge to water | Sensitive catchments in which effluent discharge is a discretionary activity:  
  - Headwaters of Mohaka River  
  - Headwaters of the Ngaruroro River  
  - Maungawhio  
  - Lake Hatuma  
  - Lake Tutira  
  - Heretaunga Plains unconfined aquifer  
  - Ruataniwha Plains unconfined aquifer  
  - Lake Whakaki  
  - Headwaters of the Tutaekuri River  
  - Headwater of the Tukituki River. Rules addressing feedlots and feedpads may apply if farm management includes practices where stocking density precludes maintenance of pasture or groundcover and/or there is a need for supplementary feeding on a regular basis. To be a permitted activity, the land used for a feedlot or feedpad shall:  
  - be managed in a manner that prevents any seepage of contaminants into groundwater  
  - be located no less than:  
    o 20 m from a surface water body  
    o 150 m from a residential building  
    o 50 m from a property boundary  
    o 20 m from a public road.  
  - Be managed to ensure runoff is prevented from entering the feedlot or feedpad. Hawke’s Bay RRMP Plan Change 6 introduces land use rules within the Tukituki River catchment. For the five years from 1 June 2013 to 31 May 2018, existing and new |
Dairy farming operations will be able to establish and continue to operate as a permitted activity under Rule TT1. Records must be kept for the property, commencing 1 June 2013, of matters listed that will enable a nutrient budget to be prepared. A farm environment plan (FEMP) and nutrient budget must be prepared by May 2018 and implemented by 31 May 2020.

If, after 31 May 2020, the measured or modelled nitrogen leached exceeds the nitrogen leaching rates for the property (based on land use capability [LUC] natural capital nitrogen leaching rates) the activity will require resource consent.

Stock must be excluded from beds and margins of rivers, lakes and wetlands. Stock races crossing streams must be bridged. Cumulative effects of land use activities are not to exceed surface water quality limits.

Properties supplied irrigation water from the community supply scheme (RWSS) will be covered by the land use consent held by the scheme and will need to meet the contractual conditions set by the scheme.

For more information on Plan Change 6: [www.hbrc.govt.nz](http://www.hbrc.govt.nz) (search ‘Tukituki River’).

<table>
<thead>
<tr>
<th>Region</th>
<th>Discharge to land with a RC.</th>
<th>Discharge to water with a RC.</th>
<th>Rules for conversions, recommendations for new conversions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taranaki</td>
<td>Discharge to land with a RC.</td>
<td></td>
<td>No specific rules for conversions, but the council recommend effluent storage plus land application systems for effluent management on new conversions.</td>
</tr>
<tr>
<td>Manawatu</td>
<td>Discharge to land with a RC.</td>
<td></td>
<td>All new conversions in the Horizons area will have to apply for a land use consent, for nutrient management. This applies to a complete conversion or bringing new land into an existing intensive operation anywhere in the Horizons Region. Preparing a nutrient management plan is the basis of the consent application. The new aspect of this approach is the calculation of an amount of nitrogen that can be leached (kg per hectare per year) based on the land use capability of the farm. A dairy effluent discharge to land consent will also need to be applied for. For more information about dairy conversions in the Horizons area, see: <a href="http://www.horizons.govt.nz">www.horizons.govt.nz</a> (search ‘dairy conversions’). For information about resource consents, see: <a href="http://www.horizons.govt.nz">www.horizons.govt.nz</a> (search ‘resource consents’).</td>
</tr>
<tr>
<td>Greater Wellington</td>
<td>Discharge to land with a RC.</td>
<td></td>
<td>No specific rules for conversions.</td>
</tr>
<tr>
<td>Marlborough</td>
<td>Discharge to land with a RC.</td>
<td></td>
<td>Any new dairy farm requires a resource consent and a management plan. This does not include any increase in the area or intensity of an existing dairy farming operation, unless the increased activity requires an additional dairy shed. This does apply if an old farm is reactivated. The new policies and rules came into effect on 25 April 2013. Marlborough District Council is currently reviewing the permitted activity dairy effluent plan rules. These are likely to be notified later in 2014.</td>
</tr>
<tr>
<td>Region</td>
<td>Discharge to land with a PA.</td>
<td>Discharge to water with a RC.</td>
<td>Specific Rules for Conversions</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Tasman</td>
<td>Discharge to land a PA.</td>
<td>Discharge to water with a RC.</td>
<td>No specific rules for conversions</td>
</tr>
</tbody>
</table>
| West Coast| Discharge to land a PA, except conversions in the Lake Brunner Catchment post-July 2010. | Discharge to water with a RC. | Lake Brunner catchment  
1) Earthworks (such as humping and hollowing (H&H) or flipping) is a discretionary activity and requires resource consent.  
2) To apply any phosphorous fertiliser to the H&H land is a permitted activity if it has a water solubility of less than 10%. Otherwise, it is a controlled activity and requires resource consent.  
3) Land application of farm dairy effluent is a controlled activity and requires resource consent – you can no longer discharge treated dairy effluent to a waterway in this catchment.  
4) Stock crossings are a discretionary activity, therefore require either a resource consent or they have to be bridged or culverted.  
5) Grazing and livestock access to riparian margins in the Lake Brunner catchment: all farmed stock animals shall be prevented from entering any waterway, with any fences to be placed a minimum distance of 1 m from the waterway edge. |
| Canterbury| Discharge to land with a RC. |                                | The Land & Water Regional Plan took effect from 18 January 2014. Once any appeals are resolved, the plan will become operative.  
The rules in the plan take into account the water quality within an area (nutrient allocation zone) and the amount of nitrogen (N) being leached by a farming activity, and regulates nitrate leaching accordingly.  
If the farm is irrigated with water from an irrigation scheme, and if that scheme holds a discharge permit covering its "command" area, then the farming activity is regulated by the terms of that discharge permit.  
All farming activities are benchmarked against a nutrient baseline which is the average of N losses from the property for 1 July 2009 to 30 June 2013. New conversions will need the nutrient leaching information from this period for the baseline period for the property. From then on, the N-loss must be calculated for each year to demonstrate losses are staying within the baseline limits. The rules in the plan are set to control and limit any increase in N above the baseline for an individual property.  
Most farms will be required to produce a farm environment plan (FEP) prior to applying for a land use consent. The FEP requirement encourages all land owners to develop and implement a plan showing how they intend to manage their environmental footprint right across the property, including such things as irrigation application, fertiliser use, offal pits, and waterway fencing.  
Useful information:  
www.ecan.govt.nz (search ‘LWRP what does it mean’)  
www.ecan.govt.nz (search: ‘LWRP infosheet’)  
www.ecan.govt.nz (search: ‘LWRP rules summary’). |
<table>
<thead>
<tr>
<th>Otago</th>
<th>Discharge to land a PA.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The discharge of effluent (and silage pit or composting waste and leachate) to water is prohibited.</td>
</tr>
<tr>
<td></td>
<td>The discharge of effluent to land is permitted, but it is prohibited to:</td>
</tr>
<tr>
<td></td>
<td>• discharge to a bore, soakhole or effluent pond that is not sealed</td>
</tr>
<tr>
<td></td>
<td>• discharge within 50 m of any river, lake, or regionally significant wetland, bore or soakhole</td>
</tr>
<tr>
<td></td>
<td>• discharge in a manner that results in ponding</td>
</tr>
<tr>
<td></td>
<td>• discharge to saturated land.</td>
</tr>
</tbody>
</table>

Other water quality matters relating to dairy conversions:

New conversions in Otago will need to determine which nutrient zone the farm falls within. A link to the maps and the plan referred to is listed below.

The discharge of nitrogen* onto or into land in circumstances which may result in nitrogen entering groundwater is a permitted activity, providing:

(a) From 01 April 2020, the nitrogen leaching rate does not exceed:

(i) 15 kg N/ha/year for the total area of land managed by a landholder that is located over the relevant nitrogen sensitive zone identified in Maps H5 and H6; and

(ii) 20 kg N/ha/year for the total area of land managed by a landholder that is located over the relevant nitrogen sensitive zone identified in Maps H1 to H4; and

(iii) 30 kg N/ha/year for the total area of land managed by a landholder that is located outside any nitrogen sensitive zone identified in Maps H1 to H6, as calculated using Oversee version 6 by a certified nutrient management advisor in accordance with Oversee Best Practice Data Input Standards.

* Nitrogen comprises of organic nitrogen, ammoniacal nitrogen, nitrite nitrogen and nitrate nitrogen forms.

Nitrogen sensitive zones – map H (to find maps go to the Otago Regional Council – Water Plan link below).

Any surface runoff or drainage discharge entering a river, lake, wetland or the coastal marine environment must not have an odour, scum, foam, floatable or suspended organic material or result in a conspicuous change in colour or visual clarity or local sedimentation at the point of discharge, or at the property boundary for a drain.

The quality of surface or drainage water leaving a property or entering a waterway within a property must be assessed to ensure it meets water quality thresholds in Schedule 16 by 1 April 2020.

The discharge of sediment from disturbed land to water in any river, lake, regionally significant wetland or the coast, or to any drain or water race that flows to them, is prohibited if nothing has been done to control sediment runoff.

Nitrogen sensitive zones – map H

[www.orc.govt.nz](http://www.orc.govt.nz) (search ‘plan change 6a’).

Otago Regional Council – Water Plan

[www.orc.govt.nz](http://www.orc.govt.nz) (search ‘water plan’).
<table>
<thead>
<tr>
<th>Southland</th>
<th>Discharge to land with a RC.</th>
<th>All new dairy conversions in Southland have to apply for four resource consents before converting.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. <strong>Discharge consent</strong> for the discharge of dairy shed effluent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. <strong>Water consent</strong> to take ground or surface water for stock watering and dairy shed wash down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. <strong>Land use consent</strong> to convert the property to a dairy farm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes profiling the soil to determine its suitability for intensive farming, and an environmental management plan to mitigate environmental risks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. <strong>Land use consent</strong> to install an effluent pond.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Additional consents may be required for the use of water bores or gravel extraction, for example.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For more information visit: <a href="http://www.es.govt.nz">www.es.govt.nz</a> (search ‘new dairy conversions’).</td>
</tr>
</tbody>
</table>
Is this property likely to come under more strict environmental regulations in the future?

As regional councils roll out plan changes to comply with the National Policy Statement for Freshwater Management some areas are likely to have more stringent environmental constraints phased in. In doing due diligence, consider the following points.

Is the farm:

- in a freshwater catchment which has a significant community values, i.e. a lake, river, wetland, lagoon, estuary, aquifer, coastal area, geothermal feature etc. Values could include natural state waters, recreation, archaeological or historical purposes, conservation, hunting and fishing, food gathering, drinking water use, energy generation, etc.
- in the catchment of waterbodies (e.g. lakes, rivers) that are considered to be highly degraded? Councils will be required to identify degraded water bodies and put plans in place to bring them above nationally-agreed bottomlines. These plans may affect all landowners in the catchment and restrict land use activities.
- in an area where there is a high population density or likely to be further urban development in close proximity to the farm?

Are there any significant or sensitive landscape features on the farm such as wetlands, waterways, landslips, poorly drained (or highly drained) areas, areas of native bush, sand dunes, geological features such as rock formations, caves etc, which may need to be carefully managed?

What are the sensitive environmental factors on this property?

Neighbouring farmers and your district and regional council may be able to help with due diligence around these topics.

- High rainfall – fewer days available for effluent irrigation.
- Low rainfall, drought prone – is there reliable and sustainable irrigation, or supplementary feed sources?
- Drainage – drain maintenance, flooding risk, sedimentation of waterways, water table issues, pugging management, winter grazing, suitability for effluent irrigation, water quality limits, suitable sites for an effluent pond or other infrastructure.
- High number or length of waterways through property.
- Presence of a wetland area.
- Hills/steep terrain – evidence of slips or unstable ground (may be unsuitable for heavy cattle), limited effluent application options, nutrient loss through water runoff, evidence of flooding in lowland areas, suitable sites for infrastructure.
- Soil type – very free draining soils may have groundwater contamination issues, poorly draining soils may have pugging and pose effluent issues, fertility, cultivation and pasture management considerations.
Planning for success

Budget constraints during the conversion process mean farmers invariably prefer the “do it once, do it right” approach. Fortunately, most actions which improve the efficiency of converting farm inputs into milk, i.e. minimising losses and optimising utilisation of inputs, are positive for the farm business economically and environmentally.

Aim for a win:win outcome – adopting good practice improves the efficiency of your farming business and has improved environmental results. The following planning goals are primarily focused on the environmental aspects of a dairy conversion. Here are four points to consider:

Allow plenty of time for due diligence

Allow time to talk to all the organisations listed in ‘information gathering’ stage, as well as other farmers who have done a dairy conversion and professional consultants. Be prepared to invest in information gathering e.g. soil mapping by professionals – information which will enable you to fully assess the land’s potential suitability for dairy farming and effluent irrigation.

Put it in writing

The old adage “failing to plan is planning to fail” may ring true. Putting plans in writing (or drawing/schematic) allows you an opportunity to reflect on ideas, possibly identify any conflicts or shortfalls, and make it a lot easier to communicate your ideas to staff and others you are working with.

Having a detailed timeline is an important part of achieving the goals of the conversion. Failure to do this could result in overruns in capital and time and missing deadlines i.e. the start of the season. Engaging contractors and tradesmen with a written contract with agreed outcomes, costs and timeframes, based on your plan, is worthwhile. Federated Farmers are able to provide a range of template contracts. (http://www.fedfarm.org.nz/services/Contracts--Agreements/)

Have a dedicated project manager

A dedicated project manager is essential for implementing a conversion plan, either the farm owner or manager, or a hired professional project manager. Their role keeps the project within time and budget constraints, verifying what is happening on the farm and keeping contractors on schedule. Communication is paramount – the project manager needs to keep in regular contact with everyone with delegated responsibilities, as well as keeping other stakeholders such as staff, investors or interested parties informed.

Utilise the help, advice and tools of experts.

Specialist consultants (professional farm mapping and farm designers) who have worked with other farm conversions may be able to do a lot of your planning and proposals for you. However, getting the right professional and service is important. The time that a qualified and reputable professional can save you, and the value they can add, in comparison to the cost of their services can make them a very good investment.

Layout of buildings and facilities

Invest time in planning the site design for the dairy and major facilities early in the project.

There are a number of important factors to consider for a proposed dairy site.

1. Topography and landscape. For some sites, it may be preferable to seek geotechnical advice to assess the site suitability for the buildings and pond placement.
   a. A relatively flat or gently sloping site is best, although being able to utilise gravity to convey effluent is ideal.
   b. The water table must be well below the minimum depth for any excavation requirements (e.g. the effluent pond).
c. Some soil types and landscape features have a lot of building constraints, for example peat soils, floodplains and proximity to waterways.

2. Proximity to three phase power, water and other amenities.

3. Facilities with room to grow in the future. Consider that the silage stack leachate, stored feed leachate, feedpad, wintering barn and other areas where effluent accumulates will need to be able to drain into the effluent storage pond (utilising natural fall and gravity will save pumping costs). Consider that you may expand the dairy, yards, pad areas or ponds in future and you will need plenty of room for vehicle access, tractor and trailer turnaround point etc. around this area.

4. Position of tanker tracks and loop, and other tracks and races. The tanker loop should not drain into tanker apron drain.

5. Regional and district council minimum distance requirements to boundaries, houses, public spaces, waterways or other features. Apply for any required consents early.

6. All dairy company rules and requirements as per their terms and conditions of supply.

7. Optimise the race and dairy layout for cow flow and functionality. Poor cow flow can lead to a number of issues including bottlenecks and excess effluent generation, as well as ongoing frustration for staff. The DairyNZ Milksmart resource is excellent for farmers planning a conversion as it covers cow flow, cow and milker comfort, good dairy and yard designs, use of robotic systems and milking efficiency visit dairynz.co.nz/milking.

**Tip**
Promote biodiversity by using a variety of native riparian plants and native shelterbelt species to create natural habitat corridors for native animals. These corridors can allow native species (birds, insects, lizards etc.) to safely move from farm to farm, district to district, promote bird and insect activity, add aesthetic value to the farm, as well as shade and shelter for stock.
Farm policies and procedures

Writing down some guiding principles for how you want the farm to be run and managed can be beneficial down the track. It can help to attract like-minded investors, find the right consultants, and recruit and train staff etc.

Ideas to consider are listed below.

1. Have a farm vision and mission statement which captures your values and goals.
2. Some farm policies may cover things like stewardship of the land, aspiring for good practice across all areas of the farm business, caring for animal and staff welfare etc.
3. Set-up a farm calendar. This covers off annual farm activities in a place where all staff can see and take ownership and initiative for attending to upcoming tasks. This includes things like the planned start of calving, mating dates, herd testing, changing rubberware, maintenance of the plant or effluent pond and irrigation equipment, taking effluent samples or calibrating the depth and rate of application from irrigators.
4. Have a whole farm plan. This covers goals, targets, key performance indicators (KPIs) and, most importantly, planned actions for success across all areas of the farm business. This should include a farm environment plan. Ensure your targets are clear and responsibility for review and reporting is assigned to someone in the business to keep you accountable.
5. Set-up a farm procedure manual. This explains how to do everyday things, such as setting up the dairy for milking, how to put the wash through, daily checks around the farm. It could outline the responsibilities of each role on-farm, who to contact for breakdowns and services and other phone numbers, what to do in certain situations (i.e. plant or machinery problems, damages, parts required etc). This is especially useful for training new staff or for relief milking staff who may not be familiar with the systems on your farm.
6. Examples of topics covered in a procedure manual:
   a) plant operation, cleaning and maintenance (daily, weekly, monthly and annual tasks)
   b) animal health and husbandry (administration of antibiotics and other animal treatments, how animals are marked and recorded when treated, lameness and mastitis detection and treatment, euthanasia, calf feeding and calf care etc.)
   c) effluent system management and maintenance
   d) health and safety requirements, for example farm visitors, use of protective clothing etc.
   e) irrigation system management, including application depths and soil moisture monitoring.

Helpful resources for creating farm policies and procedures
www.dairynz.co.nz/people (manage > policies and procedures)
www.dairynz.co.nz (search ‘HR toolkit’)
www.dairynz.co.nz/people (> legal stuff)
www.dairynz.co.nz (search ‘compliance toolkit’).
The use of technology

The planning phase is an opportunity to include the latest technology and systems into the farm business. The use of technology on-farm is rapidly evolving and a range of options should be investigated to see what might work best for your farming objectives.

Precision agriculture

Precision agriculture can offer significant farm efficiencies and opportunities for management, reporting and, ultimately, improvement. Virtually every farm key performance indicator (KPI) that can be measured can now be monitored through an electronic (cloud-based) system, which can be accessed from any web-enabled device. This is particularly beneficial for large farms and off-farm management.

Soil profile mapping

Soil profile mapping is a prerequisite for precision agriculture. Electromagnetic sensors with GPS data loggers provide rapid soil variability maps. Mapping soil variability allows the farm to be broken into management zones for soil fertility, grazing management, water holding capacity and, importantly, freshwater and effluent irrigation management.

Used with telemetered soil moisture and temperature monitoring equipment, soil profile maps can predict soil water holding capacity and allow fine-tuning of water and effluent irrigation and fertiliser application. Soils can be categorised as ‘high’ and ‘low’ risk for effluent application.

This benefits freshwater conservation, minimises any runoff and losses below the root zone, prevents nutrient loss and avoids compliance issues. Farm managers can also gain confidence with grazing management in wet conditions, preventing pugging and soil damage.

Integrated farm management software

Some farm management software incorporates GPS maps which can be used for farm design to help plan infrastructure and amenities (buildings, tracks, power, fences and waterlines etc).

This technology can make achieving compliance with councils, dairy and irrigation scheme requirements easier. Examples include GPS mapping farm waterways, wet spots and other sensitive areas, creating buffer and exclusion zones, as well as high and low risk soils for effluent application.

GPS mapping of sensitive features and classifying risk zones, while planning overall farm design, will assist in selecting suitable effluent and water application areas.

Using precision agriculture and cloud-based management software to record and manage soil fertility, effluent placement and soil moisture for grazing management, offers potential productivity, financial and environmental benefits. It is also useful for off-farm monitoring and management.

Saving energy

Energy use is an area where significant financial savings can be made, while reducing electricity consumption. The key areas of energy use are hot water heating, milk cooling and, in some instances, water pumping.

Energy saving is covered in more detail in the Sustainable actions tables.
**Sustainable actions for a responsible conversion plan**

The following list of actions should be considered when planning a dairy conversion. Any Sustainable Dairying: Water Accord commitments are listed in the left-hand column.

**Dairy conversion good practice and compliance**

<table>
<thead>
<tr>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accord targets:</strong></td>
<td>Environment support and liaison staff at the listed organisations.</td>
</tr>
<tr>
<td>New dairy farms establish and operate using good practice at the outset, to minimise potential negative consequences on water values and interests.</td>
<td></td>
</tr>
<tr>
<td>New dairy conversions must comply with all relevant regional plan rules and/or hold all necessary resource consents.</td>
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<tr>
<td>Contact any regulatory authorities (as listed below) early in the conversion evaluation process to determine what their requirements are:</td>
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<tr>
<td>• Regional councils</td>
<td></td>
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<tr>
<td>• District councils</td>
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<tr>
<td>• Dairy company – terms and conditions of supply</td>
<td></td>
</tr>
<tr>
<td>• Irrigation schemes.</td>
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<tr>
<td>Using information from this guide, develop a conversion plan or add to an existing plan.</td>
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</tr>
<tr>
<td>The aim of a conversion plan should be to meet good practice objectives and ensure compliance requirements are met throughout the farm's development period and the transition to an operational dairy farm.</td>
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</tbody>
</table>

**Effluent**

<table>
<thead>
<tr>
<th>Action</th>
<th>Resources</th>
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<tbody>
<tr>
<td><strong>Accord targets:</strong> Dairy farms will comply with regional council effluent management rules and/or resource consent conditions. Effluent systems installed on dairy farms will be fit-for-purpose and able to achieve 365-day compliance with applicable rules.</td>
<td>DairyNZ regional Compliance Checklists <a href="http://www.dairynz.co.nz/checklists">www.dairynz.co.nz/checklists</a> Accredited designers and installers <a href="http://www.effluentaccreditation.co.nz">www.effluentaccreditation.co.nz</a> DairyNZ has a wide range of resources for effluent management, covering:</td>
</tr>
<tr>
<td>Understand the rules and parameters for effluent management (regional and district councils, and your prospective dairy company) before you engage with an effluent and irrigation system designer and installer.</td>
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<tr>
<td>Map out the exclusion areas for effluent application, accounting for regional and district council, dairy company, irrigation scheme and any other requirements.</td>
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<tr>
<td>Observe minimum distances for building ponds, sheds, animal housing and the application of effluent or irrigation water in relation to boundaries, housing, bores, surface water etc.</td>
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<tr>
<td>Ensure all effluent systems are designed to Farm Dairy Effluent Code of Practice standard and that effluent storage is designed to the IPENZ Practice Note 21 ‘Farm Dairy Effluent Pond Design and Construction’.</td>
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</tr>
<tr>
<td>Have the effluent infrastructure designed and installed by accredited effluent system designers and installers.</td>
<td></td>
</tr>
<tr>
<td>Request producer statements for any large infrastructure related to effluent management and</td>
<td></td>
</tr>
<tr>
<td>DairyNZ regional Compliance Checklists <a href="http://www.dairynz.co.nz/checklists">www.dairynz.co.nz/checklists</a> Accredited designers and installers <a href="http://www.effluentaccreditation.co.nz">www.effluentaccreditation.co.nz</a> DairyNZ has a wide range of resources for effluent management, covering:</td>
<td>design criteria for effluent systems</td>
</tr>
</tbody>
</table>
sealing requirements (i.e. the storage pond, irrigation system, any concrete pads).

Ensure the effluent system is complete, contained and tested prior to the start of the milking period.

Also have an effluent management plan for the property prior to the start of the milking period.

Ensure all staff responsible for managing the effluent system receive adequate training in the use of the system, prior to the start of the milking season.

Have all staff using the effluent system attend at least one external effluent course e.g. PrimaryITO.

Make sure safety signage, fences, guard rails, barriers and equipment are in place. Ensure all staff are fully trained in the safe operation and use of the system. All practicable steps must be taken to keep people safe.

www.dairynz.co.nz/environment (> effluent)

See ‘The farm team’ section in A Farmers Guide to Managing Farm Dairy Effluent for information about staff training and induction, and health and safety requirements for an effluent system

www.dairynz.co.nz (> publications > environment > managing/operating)

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Earthworks and tracks and races

<table>
<thead>
<tr>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
</table>
| **Objective:** Minimise soil disruption, conserve topsoil, prevent erosion, prevent damage to waterway networks and ecosystems, and prevent sediment and nutrient losses to waterways. | IPENZ Practice Note 21: Farm Dairy Effluent Pond Design and Construction
www.dairynz.co.nz (search ‘IPENZ’)
www.infratrain.co.nz/Dairy_Pond_Designers.htm

DairyNZ Farmfacts:
5-9: Sediment traps
8-1: Tracks and races
5-8: Constructing and maintaining drains
www.dairynz.co.nz/farmfacts

DairyNZ MilkSmart
www.milksmart.co.nz
www.dairynz.co.nz (search ‘tracks and races’)

Check compliance requirements with the district and regional council before undertaking any significant earthworks, or altering or disrupting a waterway or drain.

Choose highly-skilled and experienced contractors to minimise erosion risks, and who will build ponds and raceways to best design practice (camber/gradient/drains/batter/compaction etc).

Complete earthworks in drier months to reduce soil runoff and erosion before tracks and races can be compacted and sealed.

Consider creating sediment traps to prevent sediment reaching waterways where there is significant soil disturbance and potential water runoff. For example major earthworks, cultivation or deforestation.

Follow good practice track and race design, directing race runoff into paddocks, grassy swale and sediment traps, and away from water channels to protect freshwater.

Apply seed to areas of bare ground which will become an erosion risk in heavy rain.

During farm planning, avoid placing tracks and raceways near waterways as much as possible.
### Waterways and wetlands

<table>
<thead>
<tr>
<th>Action</th>
<th>Resources</th>
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<tbody>
<tr>
<td>Check compliance requirements with the district and regional council before altering or disrupting a waterway or drain, or close to a waterway or drain. <strong>Waterways</strong>  - Ensure all waterways fenced off to exclude stock. The setback distance of the fence determines how much nutrients, bacteria and sediment are removed from overland flow. It will vary over the farm: a wider setback is needed on steeper paddocks, longer paddocks or heavy soils. On flatter land, smaller setbacks of 3-5 m are still capable of filtering overland flow.  - Put culverts and bridges in place at all stock crossings with appropriate sides or nibs to direct effluent away from waterways.  - Have riparian plans in place for all waterways and wetlands before the season commences. Highlight on the plan where riparian planting will occur, plant type, distribution and density, as well as planned timings of planting and maintenance.  - Avoid planting winter crops in paddocks with waterways. Leave a minimum 3 m grassy buffer between waterway and cropped area, and leave a greater buffer zone in hilly terrain. Some regional councils have specific rules around buffers for winter crops. If unsure, check compliance regulations. <strong>Wetlands</strong>  - Have any wetlands on-farm retired, fenced off and planted in suitable native wetland species.  - Ensure wetlands include areas on-farm where the soils are wettest, such as springs, seeps and swales, or gullies. <strong>Other</strong>  - Meet regional and district council minimum distances and criteria for offal pits and placement of silage and feed storage areas.  - Have a recycling system for agrichemical containers, plastics and other recyclable materials.</td>
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</table>
### Underpasses

<table>
<thead>
<tr>
<th>Objectives:</th>
<th>Action</th>
<th>Resources</th>
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</table>
| **To prevent sediment and nutrients from underpasses entering freshwater via roadside drains or other waterways** | Check compliance requirements with the district and regional council when planning an underpass. Effluent and sediment from the underpass should never be allowed to enter freshwater. Ensure the underpass design excludes freshwater from entering it. Include an effluent management system in the design to capture all effluent generated in the underpass. | DairyNZ Farmfact: 8-7: Road underpasses  
www.dairynz.co.nz/farmfacts  
IPENZ Practice Note 27 Dairy Farm Infrastructure  
www.dairynz.co.nz (search ‘IPENZ’). |

### Feedpads, stand-off pads, silage pads and animal houses

<table>
<thead>
<tr>
<th>Objectives:</th>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
</table>
| **Capture and manage all effluent and leachate which is generated from an animal feeding or housing pad, or an area used for animal feed storage.** | Check compliance requirements with the district and regional council when planning any stock housing, feeding or stock feed storage facilities. Meet minimum distances from waterways, when planning the site. Ensure feed storage facilities are designed to have an impermeable sealed surface, exclude rain and surface water, and minimise wastage/leachate. All effluent and leachate must be captured and managed within an effluent system. Include these facilities when the effluent system is being designed, to accommodate the types and volume of effluent generated from these areas. | DairyNZ Farmfacts: farm infrastructure (section 8)  
www.dairynz.co.nz/farmfacts  
DairyNZ Farmfact: 1-48: Designing silage and feed storage areas  
www.dairynz.co.nz/farmfacts  
DairyNZ Stand-off Pads publication  
www.dairynz.co.nz (search ‘stand-off pads’)  
IPENZ Practice Note 27 Dairy Farm Infrastructure  
www.dairynz.co.nz (search ‘IPENZ’). |
## Soil health

### Objective:
To maintain soil structure and productivity by preventing soil pugging and compaction damage, and erosion losses.

<table>
<thead>
<tr>
<th>Action</th>
<th>Resources</th>
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</thead>
<tbody>
<tr>
<td>Check compliance requirements for soil management, compaction and erosion damage with the regional council.</td>
<td>DairyNZ Farmfacts: 5-40: Limiting pugging and compaction damage</td>
</tr>
<tr>
<td>Identify wetter areas vulnerable to pugging and compaction on the farm and graze/irrigate/use accordingly.</td>
<td>8-4: Stand-off pads – design and construction</td>
</tr>
<tr>
<td>Map soil types for grazing/fertility/irrigation and effluent management.</td>
<td><a href="http://www.dairynz.co.nz/farmfacts">www.dairynz.co.nz/farmfacts</a></td>
</tr>
<tr>
<td>Fence off to exclude stock from small boggy patches (seeps and springs) which appear in paddocks.</td>
<td>Precision Agriculture <a href="http://www.landcareresearch.co.nz">www.landcareresearch.co.nz</a> (search ‘precision agriculture’)</td>
</tr>
<tr>
<td>Identify suitable stand-off areas or construct them for wet periods.</td>
<td>Soil Conservation Handbook <a href="http://www.landcareresearch.co.nz">www.landcareresearch.co.nz</a> (search ‘soil conservation technical handbook’)</td>
</tr>
<tr>
<td>Fence off slips and slumps and plant to improve stability.</td>
<td>Managing peat soils <a href="http://www.waikatoregion.govt.nz">www.waikatoregion.govt.nz</a> (search ‘managing peat’)</td>
</tr>
<tr>
<td>Retire steeper areas or graze with lighter stock.</td>
<td></td>
</tr>
<tr>
<td>Use direct drilling and minimum tillage where possible to conserve soil structure.</td>
<td></td>
</tr>
<tr>
<td>Sow bare soil with grass as soon as possible.</td>
<td></td>
</tr>
</tbody>
</table>

## Nutrient management

### Accord target:
Dairy farmers will manage nitrogen (N) and phosphorus (P) loss from dairy farming systems, acknowledge the need to manage within nutrient loss limits and pursue continuous improvement in nutrient use efficiency.

<table>
<thead>
<tr>
<th>Action</th>
<th>Resources</th>
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</thead>
<tbody>
<tr>
<td>Check compliance requirements with the regional council regarding nutrient use and any nutrient loss limits for your farm.</td>
<td>DairyNZ Farmfacts: fertiliser and nutrient management <a href="http://www.dairynz.co.nz/farmfacts">www.dairynz.co.nz/farmfacts</a></td>
</tr>
<tr>
<td>Prepare an Overseer nutrient budget and a nutrient management plan for the farm, breaking the farm into logical management blocks, including a separate effluent block.</td>
<td>DairyNZ regional nutrient management indicators <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘nutrient use efficiency’)</td>
</tr>
<tr>
<td>Size the effluent block area to at least meet optimum nitrogen (N) application levels (or regional council application limits). Best practice is to size the effluent block to meet maintenance potassium applications.</td>
<td>DairyNZ Farm Enviro Walk <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘farm enviro walk’)</td>
</tr>
<tr>
<td>Ensure total N application per ha per year from all sources (i.e. effluent and fertiliser) is accounted for in nutrient budget.</td>
<td>DairyNZ Farmfacts: <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (enviro &gt; land and nutrient &gt; fertiliser)</td>
</tr>
<tr>
<td>Ensure total N and P losses from the farm meet any regional council compliance limits.</td>
<td>Fertiliser Association of New Zealand resources <a href="http://www.fertiliser.org.nz/">www.fertiliser.org.nz/</a></td>
</tr>
<tr>
<td>Apply fertiliser, including urea, at professionally recommended application rates (and soil and climatic conditions) to optimise agronomic response and minimise losses.</td>
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</table>
## Water irrigation

<table>
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<tr>
<th>Action</th>
<th>Resources</th>
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</thead>
<tbody>
<tr>
<td><strong>Accord target:</strong></td>
<td><strong>Resources</strong></td>
</tr>
</tbody>
</table>
| Irrigation systems will be designed and operated to minimise the amount of water needed to meet production objectives. | DairyNZ Guide to Good Irrigation – Part 2  
www.dairynz.co.nz  
(search 'irrigation efficiency')  
DairyNZ Farmfacts:  
5-20: Factors affecting irrigation needs  
5-21: Irrigation system design and installation  
5-22: Managing irrigation practices  
5-23: Efficient irrigation  
www.dairynz.co.nz/farmfacts |
| Check compliance requirements with the regional council and irrigation scheme (if applicable) regarding freshwater irrigation management. |                                                                                                                                           |
| Select water efficient irrigation technology.                         |                                                                                                                                              |
| Ensure new irrigation systems are designed to meet the Irrigation Code of Practice and Irrigation Design Standards. |                                                                                                                                              |
| Have soil moisture monitoring technology for matching soil deficit, agronomic requirements and irrigation use in place. |                                                                                                                                              |
| Make sure all irrigation system managers have attended an external irrigation management training course e.g. IrrigationNZ and Primary ITO. |                                                                                                                                              |
| Consider variable rate irrigation and precision placement technology if effluent is distributed through a pivot, to ensure effluent is not placed near waterways or other high risk areas. |                                                                                                                                              |

**Note:** If freshwater irrigation systems, such as pivots, are going to be used to apply effluent through the mainline (e.g. a shandy), even at very low concentrations, the entire water volume will be deemed as effluent and effluent application rules apply (i.e. ponding, runoff, applying near waterways etc).

Variable rate application nozzles may be an option to avoid applying effluent in exclusion areas. A separate effluent irrigator may be necessary to irrigate independently. Ensure your irrigation system designer and installer is suitably qualified to provide compliance advice in this area.
## Water use

<table>
<thead>
<tr>
<th>Accord target: Dairy sheds will use no more water for washdown and milk cooling than that necessary to produce hygienic and safe milk.</th>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
</table>
| Check compliance requirements with the regional council, and regarding freshwater use and management. | DairyNZ guide – Smart Water Use  
[www.dairynz.co.nz](http://www.dairynz.co.nz) (search ‘smart water use’) |  |
| Make sure all water for farm use is separately metered and monitored (dairy, stock and irrigation use). | DairyNZ – A guide to Variation 6  
[www.dairynz.co.nz](http://www.dairynz.co.nz) (search ‘Variation 6’) |  |
| Ensure the plate cooler’s water pump is linked to the milk pump, so water is only running while milk is being pumped. |  |  |
| Consider water re-use technology for the yard and feed pad washdown (this can be a significant labour saver too). |  |  |
| If using manual yard washing, ensure low water use hoses are selected and staff are trained in the most water and time efficient methods for washdown. |  |  |
| Capture rainwater for non-food surface cleaning use (in high rainfall areas, this clean freshwater may be diverted away from the dairy). |  |  |
| Use isolation and automatic shut-off valves and alert systems to avoid water losses. Mark isolation valves with flags or signs and ensure farm staff know how to use them. |  |  |
| GPS map stock waterlines and junctions for repairs and maintenance, and to avoid damage from future earthworks. |  |  |
| Ensure any water leaks on the farm are fixed as soon as possible. |  |  |
### Energy use

<table>
<thead>
<tr>
<th>Objective: Reduce energy use</th>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evaluate energy saving options for milk cooling – such as adequately sized plate coolers, glycol and icebanks, and vat compressors.</td>
<td>NZ Energy Efficiency &amp; Conservation Authority (EECA) provides practical advice and details of funding to help make your dairy shed more efficient and save money <a href="http://www.eecabusiness.govt.nz/dairy-farms">www.eecabusiness.govt.nz/dairy-farms</a></td>
</tr>
<tr>
<td></td>
<td>Ensure the plate cooler’s water pump is linked to the milk pump, so that water is only running while milk is being pumped.</td>
<td>Dairy Farm Energy Spend Poster <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘electricity efficiency’)</td>
</tr>
<tr>
<td></td>
<td>Consider variable speed drives for vacuum and milk pumps in the dairy, and large water pumps.</td>
<td>DairyNZ Stand-off Pads publication <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘stand-off pads’)</td>
</tr>
<tr>
<td></td>
<td>Look for the most energy and cost-effective methods, and timing, for heating water.</td>
<td>DairyNZ Cow Health and Condition Stocksense course <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘stocksense’)</td>
</tr>
<tr>
<td></td>
<td>Where possible, place the milk vat, refrigeration and condenser units on the coolest side of the dairy and consider vat insulation wraps.</td>
<td>DairyNZ Healthy Hoof <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘healthy hoof’)</td>
</tr>
<tr>
<td></td>
<td>Consider using motion sensor or timer lights around the dairy and yard area, and energy-efficient lightbulbs.</td>
<td>DairyNZ Stocksense calf management course <a href="http://www.dairynz.co.nz/stocksense">www.dairynz.co.nz/stocksense</a></td>
</tr>
<tr>
<td></td>
<td>Include plenty of natural lighting in the dairy design.</td>
<td>DairyNZ bobby calf pack <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘bobby calf pack’)</td>
</tr>
</tbody>
</table>

### Animal welfare

<table>
<thead>
<tr>
<th>Objective: To optimise animal health and welfare</th>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ensure accurate feed budgeting is in place so there will be enough feed on-hand while pastures are establishing, and for adverse weather events.</td>
<td>DairyNZ Stand-off Pads publication <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘stand-off pads’)</td>
</tr>
<tr>
<td></td>
<td>Make a comfortable and suitable stock stand-off area available for wet weather.</td>
<td>DairyNZ Cow Health and Condition Stocksense course <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘stocksense’)</td>
</tr>
<tr>
<td></td>
<td>Ensure adequate shade and shelter is available to stock when required.</td>
<td>DairyNZ Healthy Hoof <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘healthy hoof’)</td>
</tr>
<tr>
<td></td>
<td>Design tracks and races, yards and animal holding/feeding areas to minimise the risk of lameness.</td>
<td>DairyNZ Stocksense calf management course <a href="http://www.dairynz.co.nz/stocksense">www.dairynz.co.nz/stocksense</a></td>
</tr>
<tr>
<td></td>
<td>Size stock holding facilities to meet minimum space requirements for the number of animals they will hold (yard, wintering barns, feed pads, stand-off pads etc.)</td>
<td>DairyNZ bobby calf pack <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘bobby calf pack’)</td>
</tr>
<tr>
<td></td>
<td>Have an animal health management plan in place, in consultation with a veterinarian. Train staff (responsible for animal treatment) in their use.</td>
<td></td>
</tr>
</tbody>
</table>
Responsible dairy conversions

Make sure calf rearing facilities are warm, dry, comfortable and adequately sized. Train staff responsible for calf-rearing and have them ready to start.

Have bobby calf facilities and policies in place.

Ensure that the water supply to livestock is adequate (both quality, flow rate and number of troughs per cow).

Be aware of responsibilities when transporting livestock.

Create a contingency plan to get cows milked at least once-a-day in the event of an extended power outage.

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### People

<table>
<thead>
<tr>
<th>Objective:</th>
<th>Action</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>All minimum legal requirements around employment management are met.</td>
<td>Have the terms and conditions of your employment relationship in a written employment agreement, along with an accurate written job description of the work the employee will do.</td>
<td>Federated Farmers’ Individual Employment Agreements <a href="http://www.fedfarm.org.nz">www.fedfarm.org.nz</a></td>
</tr>
<tr>
<td>Staff are looked after in a compassionate, fair and equitable way.</td>
<td>Ensure staff are paid a fair wage or remuneration package for the work they do.</td>
<td>Federated Farmers’ New Employment Pack <a href="http://www.fedfarm.org.nz">www.fedfarm.org.nz</a></td>
</tr>
<tr>
<td>Health and safety policies and requirements are in place to protect all people coming onto the property.</td>
<td>Have employees’ leave entitlements managed.</td>
<td>DairyNZ recruitment resources <a href="http://www.dairynz.co.nz/people">www.dairynz.co.nz/people</a> (&gt; recruitment)</td>
</tr>
<tr>
<td></td>
<td>Have a clear orientation plan in place for new employees, to introduce them to the farm and business and establish the expectations required from the outset.</td>
<td>DairyNZ QuickStart recruitment and productivity kits <a href="http://www.dairynz.co.nz/quickstart">www.dairynz.co.nz/quickstart</a></td>
</tr>
<tr>
<td></td>
<td>Ensure health and safety plans, policies and procedures are in place. Farm and work activities must be safe and healthy for all people working on the farm. Complete a health and safety induction for new staff and contractors.</td>
<td>DairyNZ HR Toolkit <a href="http://www.dairynz.co.nz">www.dairynz.co.nz</a> (search ‘HR Toolkit’)</td>
</tr>
<tr>
<td></td>
<td>Ensure staff living and working conditions are comfortable, suitable and safe (considering staff family members too).</td>
<td>DairyNZ Compliance Toolkit <a href="http://www.compliancetoolkit.co.nz">www.compliancetoolkit.co.nz</a></td>
</tr>
<tr>
<td></td>
<td>Have processes in place to manage rosters and ensure staff do not become inappropriately fatigued or stressed, especially during busy periods on farm. Keep timesheets are for all employees on farm.</td>
<td></td>
</tr>
</tbody>
</table>
Other helpful DairyNZ resources for new farms

Farmfacts
www.dairynz.co.nz/farmfacts

Spring Survival Guide
www.dairynz.co.nz/springsurvival

Facts and Figures
www.dairynz.co.nz/factsandfigures

Farm Management Calendar and Seasonal Diaries
www.dairynz.co.nz/seasonaldiary

InCalf
www.dairynz.co.nz/incalf

Mastitis management
www.dairynz.co.nz/smartsamm

Managing adverse events
www.dairynz.co.nz/adverseevents

Feed management resources
www.dairynz.co.nz/feed

Animal health and management resources
www.dairynz.co.nz/animal

Farm budgets
www.dairynz.co.nz/budgets

Farm governance workshops
www.dairynz.co.nz/governance
**Implementation**

A responsible conversion plan covers the time period before and during the dairy conversion – identifying a list of good practice actions, relevant and suitable for your particular farm and situation, and incorporating them into the conversion plan.

A responsible conversion plan is about striving to be good dairy industry ambassadors, while setting up a successful and sustainable business.

As a minimum, all new conversions should meet compliance and the Sustainable Dairying: Water Accord targets.

Once the conversion is completed, an ongoing environment plan (which may include areas of further development, such as ongoing planting or expansion of the dairy platform) should be developed.

An ongoing environment plan should ensure the farm continues to meet dairy company, council and your own expectations and objectives for the property. This may be a compliance requirement for some farms – in which case, plans may be audited by an external party (e.g. some irrigation schemes).

If a plan is a compliance requirement, usually the organisation requesting it can provide a template. DairyNZ have resources available which may help with the plan preparation. For example, some catchments are completing Sustainable Milk Plans which are a type of whole farm plan.
A responsible conversion case study

Chris and Lynsey Stratford – managing partners, Curio Bay, Southland.

Strategic thinking

The South Coast Dairy partnership began converting a 200ha sheep and beef farm to dairy near Curio Bay, Southland in 2009.

The partnership involves five families and, from the outset, a strong governance focus ensured the group had a clear vision, mission, values and key performance indicators. Managing partners Chris and Lynsey Stratford say clear communication is a key aim, and quarterly conference calls and two face-to-face meetings a year are backed by monthly financial and farm reports produced by the couple.

“Strategic goals include being branded as a business which showcases best practice and key performance indicators include production, financial and environmental goals which are measured annually against clear criteria to keep the partnership accountable to its strategic goals,” says Chris.

The landscape

The property sits on gently rolling to easy hills between Curio Bay and the Haldane Estuary. The milking platform is 135ha, with about 18ha of sand country and 29ha of rare original almost-coastal podocarp forest.

The remaining 20ha includes riparian margins, gullies and wetlands. The farm has just finished its fourth production season, peak milking 374 cows and producing 169,300kg/MS from a mainly grass system.

Starting with a ‘blank canvas’, the partnership engaged a number of professionals to provide advice about the property’s soil types and features and to plan the infrastructure for the conversion. “A key message would be to get good advice from trusted professionals.”

The partnership talked to other farmers about recommendations for designs and contractors, and visited their sheds to get ideas. “Gather as much information as you can and decide what will work for the farm system you want.”
The unique features of the property, including wetlands, sand country, a freshwater lake and the podocarp forest meant a number of stakeholder groups had an interest in the land.

The partnership worked hard to form positive relationships with these groups, including Fish & Game, iwi, Department of Conservation and Environment Southland from the outset. The advice and contacts these stakeholders provided was essential to the conversion’s success.

The partnership knew what they wanted to achieve but these groups provided expertise in the form of ‘how to’. The land sustainability team from Environment Southland were especially helpful. They created shelter planting plans for the property and recommended suitable species to survive in the coastal environment, which has very strong winds.

They also introduced the LandCare Trust representative who provided practical help and secured funding for fencing and protection of the podocarp forest.

The conversion process

The whole property was re-grassed during the conversion, lanes created, paddocks fenced and a reticulated water system installed, with troughs to all paddocks. The fence lines, water lines, troughs and water taps were all GPS mapped to aid in future maintenance.

Taps were installed to allow water to be turned off to different blocks, if leaks needed management. The water system also enables minerals to be added to keep the stock in good condition.

Waterways

Once the water system was installed, all waterways were fenced off.

“The riparian margins are between 5 and 30 metres, depending on the contour of the land. The wide buffers ensure that any runoff from paddocks is fully filtered before it reaches waterways and no productive land was lost in the process. Riparian buffers have been planted, with native species to increase biodiversity and provide stock shelter, prevent soil erosion, filter any runoff and shade riparian areas, which improves habitat for fish.”
So far more than 10,000 plants have been planted across the property. Planting and release spraying of these plants is an ongoing project which happens each year, to keep the workload manageable. Community groups, including the Lions and the YMCA Conservation Corp, have helped with this.

“It is a win-win,” says Chris. “We get help with the workload and they raise funds for community projects or get valuable work experience.”

The partnership began water quality testing through Environment Southland before the conversion when sheep and beef stock accessed the water from waterways and before the dairy farm was operational.

They continue a programme of voluntary quarterly testing across the property. This has shown a significant improvement, particularly in clarity and the reduction in coliforms since the water system was introduced, the waterways fenced and the dairy farm operational.

**Effluent and nutrient management**

Effluent system design and construction was very important and the partnership engaged ‘accredited designers’ to design the system. Once the system design and specifications were complete, the job was tendered to accredited installers.

The system uses a weeping wall to separate the solids. Liquids are then pumped to a storage pond with 120 days storage. The extra storage means that the pond is future-proofed but, more importantly, effluent can be stored until the optimum time and conditions to apply for grass growth.

The extra capacity allows nitrogen to be stored to control use and avoid any leaching – the system is backed by onsite soil moisture tapes which measure soil capacity and ensure effluent is only applied when conditions are right. Extra storage also takes the pressure off on-farm during busy times like calving. Effluent can be stored until time is available to move the low application rate k-line pods.

The effluent application area was created to avoid any high risk paddocks e.g. those with waterways. A fail safe system is in place to mitigate any risks with the system. Documented policies and procedures for managing the system are backed up by on-farm training and Primary ITO training in effluent management.
Saving energy and water

The dairy was built using best practice water and energy use at the time but the partnership regularly monitor new developments and improvements in technology to ensure they are keeping up with best practice.

“DairyNZ’s Water Smart resources have been useful,” says Chris. “And we did an energy audit using the EECA resources to look for areas to improve last year which resulted in us installing vat insulation. The EECA resources are great because they tell you how long it will take for your investment to pay for itself.”