

Dairy Green Ltd

Practical Engineering Solutions

Consents, Effluent, Stock water, Irrigation

Design through to Installation

Irrigation NZ Accredited Designer

Woldwide One Limited and Woldwide Two Limited

**Land use consent application for a feed pad/lot – Rule 35 A of pSWLP
(2019)**

Woldwide 1 unit – wintering barn

Farm Location: Heddon Bush

Application prepared on behalf of applicant by Dairy Green Ltd.

Table of Contents

1. Overview.....	3
2. Consent required	4
Feed pad/lot.....	4
3. Statutory considerations	5
Statutory considerations:	5
4. Notification.....	9
5. Receiving Environment.....	10
6. Proposal Details.....	12
Legal description.....	12
Location	12
Wintering barn usage	13
Wintering barn construction	13
Effluent storage	14
Effluent irrigation.....	14
Buffer distances	14
7. Assessment of Environmental Effects	15
Design, location and construction	15
Management of wintering barn and supporting effluent management system.....	16
Conclusion.....	16

1. Overview

Woldwide One Limited (WW1) and Woldwide Two Limited (WW2) operate two adjoining dairy farms situated at Heddon Bush. Both dairy farms are under the same ownership structure. Each dairy farm has an existing wintering barn that requires consent under Rule 35A of the pSWLP.

WW1 currently operates under an effluent discharge permit (AUTH-301663) and water permit (AUTH-301664). WW2 currently operates under a land use consent for expanded dairy farming (AUTH-20171278-03), effluent discharge permit (AUTH-20171278-01) and water permit (AUTH-20171278-02). An application has been submitted to Environment Southland to bring the WW1 and WW2 dairy platforms under a single land use consent for dairy farming. Respective discharge permits will also be replaced to bring the discharge activities under a single discharge permit. The name of the new consent holder on the land use consent for dairy farming, the discharge and water permits will be “Woldwide One Limited and Woldwide Two Limited.” Likewise, the name of the consent holder on the land use consent for the feedpad/lot located on the Woldwide 1 unit will be “Woldwide One Limited and Woldwide Two Limited.”

This application is to obtain a land use consent under Rule 35A of the pSWLP (2018), authorising the use of land for an existing feed pad/lot at WW1 unit, WW1&2 dairy farm. In accordance with Rule 35A (b) the use of land for a feed pad/lot is a discretionary activity. The feed pad/lot is a concrete wintering barn that will house a maximum of 625 cows over winter and in the shoulders of the season as required and has supporting effluent infrastructure in place.

The proposed use of land for a feed pad/lot has been considered in terms of key pSWLP policies and based on this assessment should be granted. Effects on the existing environment have been considered and are described in the assessment provided in Section 7. The existing feed pad/lot was designed, located and is managed to avoid or mitigate risks to water quality and soil health. The assessment concludes that effects on receiving surfacewaters, groundwater and soils, including cumulatively, will be less than minor due to the use of land for the WW1 feed pad/lot at WW1&2 dairy farm.

Effluent generated in the barn is collected, stored and applied to land according to best practice management at a time when plants are actively growing, allowing nutrients to be taken up by plants. Construction of a wintering barn and supporting effluent management has been a significant investment by the applicants and demonstrates their commitment to environmental sustainability in the long term. *On this basis a term of 15 years is requested for the land use consent for a feed pad/lot.*

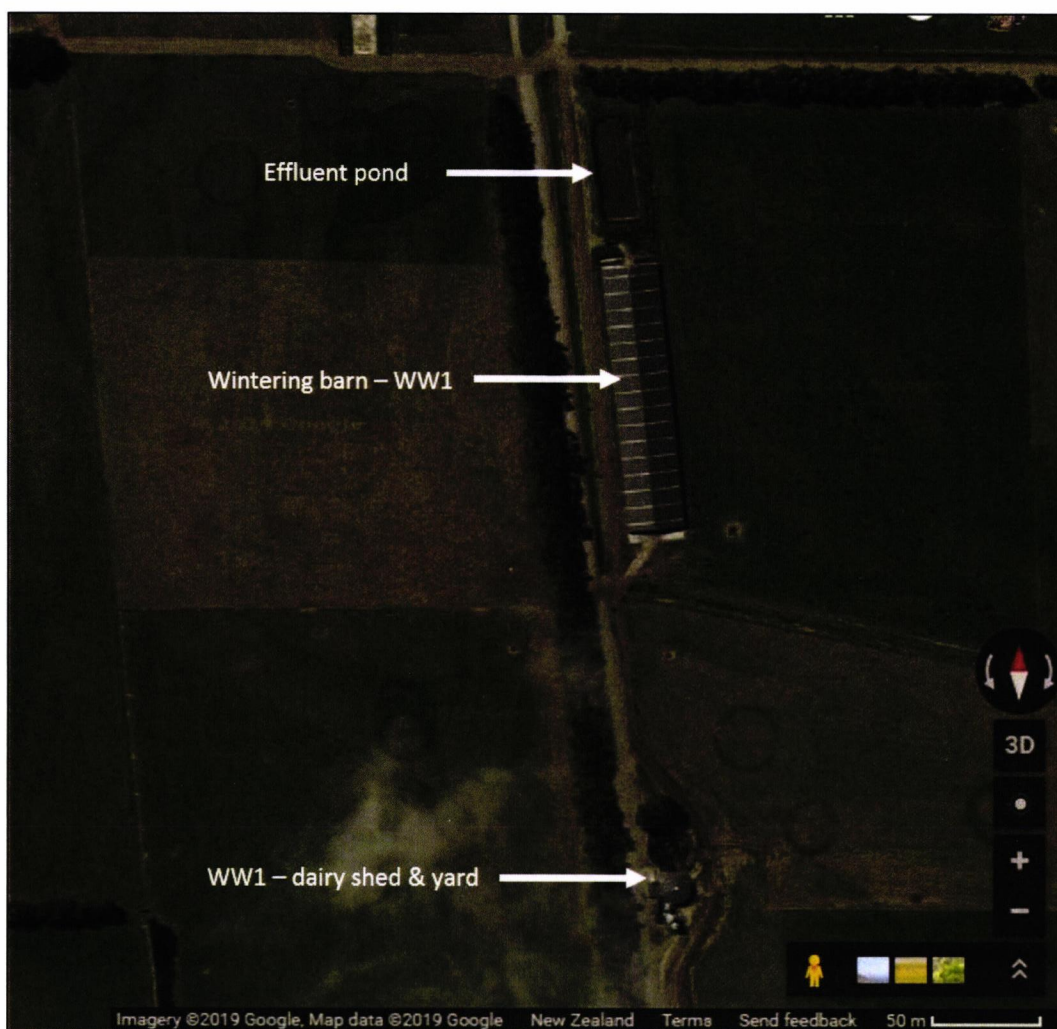


Figure 1. Wintering barn at WW1 unit, WW1&2 dairy farm.

2. Consent required

The decision version of the pSWLP was notified on 4 April 2018. In accordance with Section 86B(1)(a) and (3) of the Resource Management Act 1991, all provisions of the Proposed Plan have had legal effect since this date. Although the Southland Regional Water Plan (2010) and Regional Effluent Land Application Plan are still operative, they do not manage the use of land for feed pads/lots through specific rules.

Feed pad/lot

Under Rule 35A, the use of land for a feed pad/lot is a permitted activity, provided the conditions described in Rule 35A (a) are met. In this instance, Rule 35A (a) (i) is not met as the wintering barn houses more than 120 adult cattle at one time. Rule 35A (a) (ii) is not met as a small number of late calving cows will remain in

the barn during September; some animals will remain on the feed pad/lot for longer than three continuous months. Rule 35A (a) (iii) (1) is not met as the nearest waterway is within 50 metres of the barn; a stream flows adjacent to the west side of the barn. The use of land for the feedpad/lot meets the remaining conditions specified in Rule 35A.

In accordance with Rule 35A (b), the activity is a discretionary activity since it does not meet one or more conditions described in Rule 35A (a).

3. Statutory considerations

Statutory considerations:

Environment Southland must consider the following matters when they consider an application. The application is consistent with all of these relevant plans and policies because effects on water quality and quantity and the soil resource should be less than minor.

Resource Management Act 1991:

- The provisions of section 104 of the Resource Management Act 1991;
- Part 2 of the Resource Management Act;
- The applicant's assessment of effects on the environment;
- The provisions of Sections 104B, 104C, 105 and 107 of the Resource Management Act 1991.

Part 2 of the RMA

The activity is considered to represent an efficient use of natural resources that will give rise to significant positive benefits in terms of providing for the social and economic wellbeing of the applicants and the wider regional economy. There is, however, the potential for adverse effects on the environment to arise, including on water quality. However, it is considered that the effects of the activities have been adequately identified and assessed in the Assessment of Environmental Effects in Section 7 below and that such effects will be no more than minor.

It is considered that the proposed use of land for a feed pad/lot will not impact directly on the coastal environment, wetlands, and lakes and rivers and their margins, although there is potential for adverse effects on the wider receiving environment which is inclusive of some of these features. However, as is discussed in Section 7 below, the actual and potential adverse effects of the activities are considered to be no more than minor.

Section 7 of the Act lists a number of other matters that a Consent Authority must have particular regard to when considering applications for resource consent. For the reasons discussed in Section 7 of this report below, the proposal is considered consistent with relevant provisions of Section 7 of the RMA.

Section 8 sets out a Consent Authority’s responsibilities in relation to the Treaty of Waitangi. The proposal is considered consistent with the provisions of all regional planning documents, including Te Tangi oTaurira, and Sections 6(c) and 7(a) of the Act. Therefore the proposal can also be considered consistent with Section 8 of the Act.

To avoid repetition, the following documents have been grouped together under common headings in the sections that follow.

Table 3.1: Ngai Tahu Values

Regulatory Document	Relevant Sections
National Policy Statement for Freshwater Management 2014	<ul style="list-style-type: none"> • Objectives C1, D1 • Policies C1, D1
Southland Regional Policy Statement 2017	<ul style="list-style-type: none"> • Objectives TW.2, TW.3, TW.4 and TW.5 • Policies TW.3, TW.4 and TW.5
Regional Water Plan 2010	<ul style="list-style-type: none"> • Objective 9C • Policy 1A
Regional Effluent Land Application Plan 1998	<ul style="list-style-type: none"> • Objectives 4.1.4, 4.1.5 • Policies 4.2.4, 4.2.7, 4.2.8, 4.2.9
Proposed Southland Water and Land Plan 2018	<ul style="list-style-type: none"> • Objectives 3, 4, 5, 15 • Policies 1, 2, 3
Te Tangi a Taurira:	<ul style="list-style-type: none"> • Whole Document

Tangata Whenua values have been considered when preparing this application including reference to Te Tangi a Taurira (Iwi Management Plan). The principles of protection of the mauri of the water and mana of the land while minimising adverse effects on mahinga kai will continue to be recognised and have regard to in the exercise of the consent. There are no known wahi tapu, ancestral sites, heritage sites or other taonga associated with the property.

Table 3.2 Water Quality

Regulatory Document	Relevant Sections
National Policy Statement for Freshwater Management 2014	<ul style="list-style-type: none"> Objectives A1, A2, B1, B2, B3, B4, Policies A3, A4, B5, B6, B7
Regional Policy Statement for Southland 2017	<ul style="list-style-type: none"> Objectives WQUAL.1 and WQUAL.2 Policies WQUAL.1, WQUAL.2, WQUAL.3, WQUAL.7, WQUAL.8, WQUAL.12
Regional Effluent Land Application Plan 1998	<ul style="list-style-type: none"> Objectives 4.1.2 Policies 4.2.3, Rule 5.4.5
Regional Water Plan 2010	<ul style="list-style-type: none"> Objectives 3,4,8 Policies 1, 4, 6, 7, 13
Proposed Southland Water and Land Plan 2018	<ul style="list-style-type: none"> Objectives 1, 2, 6, 7, 8, 9, 13, 18 Policies 5, 10, 13, 14, 15, 16, 17, 39, 39A, 40 Rules 35, 35A
Te Tangi a Taurira	<ul style="list-style-type: none"> Policies 1, 4, 5, 6, 11, 16, 17, 18

The wintering barn and supporting effluent management infrastructure were constructed and are operated according to best industry practice standards and Council rules and policies. The wintering barn has been sited and constructed to avoid the risk of stormwater flow or overland flow into or from the structure. Dung and urine from cows housed in the wintering barn is collected automatically into a concrete collection pit from where it is pumped to a large effluent storage pond, stored and applied to land according to best practice effluent management and consent conditions. Through the design, construction and operation of the wintering barn and supporting effluent management system, there is no loss of effluent to receiving surfacewaters, groundwater or adverse effects on soils.

Wintering barn effluent is discharged to land at very low depth in accordance with Rule 35 of the pSWLP. Wintering barn effluent forms a slurry due to its high DM content. Discharging wintering barn effluent (slurry) at very low depth to land when there is sufficient soil moisture deficit allows plants to take up nutrients and minimises the risk of contaminant loss to receiving waters via deep drainage, artificial drainage or overland

flow. When there is insufficient soil moisture deficit to safely apply effluent to land without risk of drainage and contaminant loss, wintering barn effluent is stored in the pond.

Housing cows in the barn over winter and in the shoulders of the season reduces contaminant loss to water from intensive winter grazing practices and reduces soil damage such as pugging. This is in line with several key policies regarding maintaining and improving water quality.

Table 3.3 Soil Health and Effluent Management

Regulatory Document	Relevant Sections
Regional Policy Statement for Southland 2017	<ul style="list-style-type: none"> Objectives WQUAL.1 and WQUAL.2 Policies WQUAL.1, WQUAL.2, WQUAL.3, WQUAL.7, WQUAL.8, WQUAL.12
Regional Effluent Land Application Plan 1998	<ul style="list-style-type: none"> Objectives 4.1.1 Policies 4.2.1, 4.2.2
Regional Water Plan 2010	<ul style="list-style-type: none"> Policy 41 Rule 49
Proposed Southland Water and Land Plan 2018	<ul style="list-style-type: none"> Objectives 13, 13A, 14, 15, 18 Policies 5, 10, 17, 33 Rule 32B, 35, 35A, 41
Te Tangi a Tauira	<ul style="list-style-type: none"> Policies 4, 7, 8, 9, 11, 13, 14, 15

The applicants seek to ensure the life supporting capacity of the soil is safeguarded, along with the sustainability of the soil ecosystem by using land for an existing wintering barn without significant adverse effects. A maximum of 625 cows are housed in the barn over winter and in the shoulders of the season as required. Dung and urine from cows are collected, stored as a slurry in the effluent pond. Slurry effluent is be applied to land according to best practice management and relevant Council rules and policies. The soils are suitable to receive solids and for effluent irrigation. These activities follow current good management practice described in the Farm Environmental Management Plan. These include practices of a general nature and those specific to the key contaminant transport pathways for the physiographic zones (Central Plains and Oxidising).

This system is sustainable in the long term and allows slurry effluent to be used both as a fertiliser and a soil conditioner.

In addition to the matters in Section 104 of the Act, when considering an application for a land use consent for the use of land for a feed pad/lot a Consent Authority must also have regard to Section 105. As is

discussed in the assessment under Section 7, it is considered that provided the activity is undertaken in accordance with the conditions of the consent and the best practice management techniques, the adverse effects of the activity should remain minor.

There are not considered to be any matters under Section 107 of the Act that would require the Consent Authority to decline the application for a land use consent for a feed pad/lot.

4. Notification

Section 95A of the Act requires that the Consent Authority must publicly notify an application if it decides under Section 95D of the Act that the activity will have or is likely to have adverse effects on the environment that are more than minor. The only exception to this is when a rule or NES precludes public notification of the application and that there are no special circumstances in relation to the application that would warrant such a rule or NES to be dispensed with. However, in this instance there is no rule or NES that precludes public notification of the application and therefore the 'more than minor effect on the environment' test provided by Section 95D of the Act applies. As is explained in Section 7/AEE, the use of land for WW1's wintering barn at WW1&2 dairy farm will have effects on the environment that are no more than minor. As such public notification is not required.

5. Receiving Environment

The wintering barn is found in the Waimatuku surfacewater management zone. Table 5.1 summarises the receiving environment (i.e. soils, surfacewater and groundwater resources) in the vicinity of the wintering barn. *For a detailed description of the receiving environment, please see Section 5 of WW1&2's consent application.*

Table 5.1 Soils, surfacewater and groundwater resources in the vicinity of the wintering barn.

Soils	Soil Type	Vulnerability Factors		
		Structural Compaction	Nutrient Leaching	Waterlogging
	Drummond	Minimal	Moderate	Slight
	Glenelg	Slight	Very severe	Nil
	Braxton	Moderate	Slight	Severe
FDE land classification	A – artificial drainage or coarse soil structure E – other well drained but very stony flat land (Likely to be D – well drained flat land, but this is not mapped)			
Characteristics of FDE risk classification	A - high risk to surface water, low risk to groundwater D, E – low risk to groundwater using low depth application, low risk to surfacewater			
Topography	Flat			
Groundwater nitrate levels	3.5 - 8.5 g/m ³			
Groundwater zone	Waimatuku			
Surfacewater management zone	Waimatuku			

Physiographic zones	Central Plains
	Oxidising
FMU	Aparima
Nearest downstream registered drinking water supply (downstream and is same catchment)	Heddon Bush School – 3 km due south of wintering barn
Downstream Regionally Significant Wetland/Sensitive Waterbody	Drummond Peat Swamp (>10 km to south east)
	Bayswater Bog (>10 km to south west)

6. Proposal Details

Legal description

Table 6.1 Legal description

Infrastructure	Title	Legal description
Wintering barn site	SL168/127	Part Lot 18 DP 942
Effluent pond site	SL168/127	Part Lot 18 DP 942

Location

The barn is sited to the north of the dairy shed at (NZTM2000) E 1225139, N 4888995. Figure 6.1 below shows the location of the wintering barn and effluent pond. The barn location is sufficiently dry, elevated and has adequate drainage, to avoid the risk of overland flow of stormwater or surface runoff into or from the wintering barn at any time.

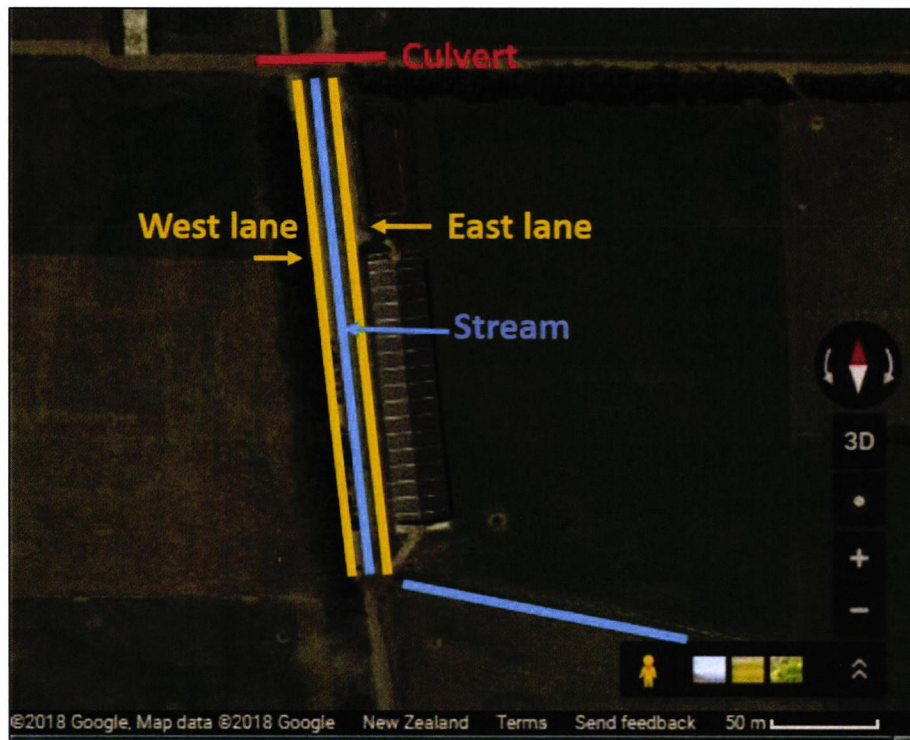


Figure 2. Lanes and stream (flowing to Waimatuku catchment) found to the west of the wintering barn at WW1.

Wintering barn usage

Table 6.2 outlines how the wintering barn will generally be used. *Cow number, hours per day and days per month* are three variables that determine usage per month (not just *cow number*).

The wintering barn will house the maximum cow number (625) 24 hours per day over the entire month for June and July only. In May, August and September, cows being housed for part of the day/part of the month depending on soil and climatic conditions at the time.

Average usage in May, August and September is represented in the below table; e.g. the barn will be used for 50% of May. This can be achieved by housing 313 cows 24 hours per day for 31 days, or by housing 625 cows 12 hours per day for 31 days or by housing 625 cows for 24 hours per day for 15 days.

Cows are not calved in the barn.

Table 6.2 Wintering barn usage

Use of wintering barn				
Month	Cow numbers	Hours/day	Days	Average 50% usage for month
May	625	12	31	50
June	625	24	30	100
July	625	24	31	100
Aug	370	23	31	59
September	75	23	30	12

Wintering barn construction

The existing wintering barn is a sealed, concrete free-stall structure.

Barn dimensions: 29 m x 122 m

Construction of the barn was regulated by Southland District Council through a building consent. The structure was constructed by Bert's Engineering in 2006. The site was prepared by an earthwork's contractor, who carried out the required earthworks.

The barn has a sealed concrete floor surrounded by 200 mm high concrete nib walls. Effluent from the barn is automatically scraped into a concrete collection pit from where it is pumped to the storage pond, which also stores effluent from the dairy shed as required. The barn has a small uncovered concrete area (170 m²),

which has been included in the Massey DESC reports. A rainwater diversion is always used for rainwater collected on the barn roof.

Effluent storage

Effluent from the barn is primarily composed of dung and urine, given the lack washdown water and only source of rainwater from the small uncovered area. The effluent storage system has sufficient storage to meet the requirements of the wintering barn usage outlined in table 6.2 and has 4,281 metres cubed metres cubed of storage available, plus 0.5 metres freeboard. This is sufficient for effluent from the wintering barn (and other sources), according to the Massey DESC provided in the Appendix.

The effluent storage pond was upgraded in 2018 to install a synthetic liner and leak detection system to meet PN 21 requirements and to provide storage for effluent from 625 cows in the barn. It is described in detail in the replacement application for the discharge permit.

Effluent irrigation

As is explained in the discharge permit replacement application, wintering barn effluent is applied to land as follows:

- I. The effluent flows by gravity and is scraped automatically approximately 8 times per day to the concrete effluent collection sump, from where it is pumped to WW1's storage pond.
- II. The effluent is stored in the pond until soil moisture conditions allow for irrigation to occur.
- III. The effluent is pumped from the pond to the slurry tanker with a trailing shoe (no more than 2.5 mm/application) or umbilical system (no more than 3 mm per application) and irrigated at very low depth to land; and
- IV. A rainwater diversion is always in place for water collected on the roof.

Buffer distances

The wintering barn has buffer distances as outlined in table 6.3. These are mapped in the FEMP for WW1.

Table 6.3

Buffer distances from wintering barn	
Nearest subsurface drain (m)	450
Nearest surface waterway (m)	15
Microbial health protection zone of a drinking water supply site (Appendix J) etc.	None
Dwelling not on same landholding (m)	>1,000
Landholding boundary (m)	550
Critical source area (m)	750

7. Assessment of Environmental Effects

Adverse environmental effects from the use of land for a feed pad/lot, including wintering barns, can occur where the feed pad/lot is poorly designed, located or managed. Adverse effects can occur where contaminants present in dung and urine from cows housed in the barn (nutrients N, P, sediment and faecal microbes) reach receiving ground and/or surfacewaters via pathways such as artificial drainage or overland flow. Adverse effects on soils can occur if soils are overloaded with nutrients from barn effluent.

Design, location and construction

WW1's wintering barn at WW1&2 dairy farm was designed and constructed according to a building consent granted and administered by Southland District Council. Construction of the barn was carried out by Bert's Engineering and authorised by a building consent (SDC). The earthworks and concrete work were carried out by experienced firms and trade's people under contract. The risk of flooding and overland flow were key considerations in choosing a suitable site for the barn and supporting effluent storage facilities (pond and concrete collection pit), as were distances to waterways, subsurface drainage, bores and critical source areas. The barn is sited to avoid the risk of stormwater or overland flow into or from the barn.

As shown in figure 2, the nearest waterway flows adjacent to the barn (15 metres to the west) with a cow lane in between. The barn is on an elevated site and has a fully sealed concrete floor surrounded by 200 mm high concrete nib walls. Effluent cannot escape from the barn due to the concrete nib walling. Effluent is scraped automatically to a concrete collection pit approximately 8 times per day when the barn is in use. Due its sealed concrete flooring and protection by concrete nib walls, the risk of effluent generated within the barn reaching the waterway is avoided.

There are no CSAs within the barn site that could potentially channel contaminants to surfacewater. The nearest subsurface drain is over 450 metres from the barn location, which minimises the risk of contaminant loss from the barn to subsurface drainage. The nearest bore (E45/0071) is over 150 metres to the south of the barn site.

Operation of the wintering barn depends on having an effective effluent management system, to collect, store and discharge effluent that is generated in the barn. The barn's effluent management system was designed and constructed according to the relevant Council rules to meet best industry practice (i.e. IPENZ Practice Note 21). CPEng and Council sign off was required for both the design and completion of the effluent storage facility, which was reconstructed in 2018. Project management will be overseen by Dairy Green Limited, who have over 30 years of experience in the design and construction of effluent management systems in Southland.

Through appropriate design, location and construction of the wintering barn, no contaminants will be lost to receiving surfacewaters or groundwater. Contaminants are collected, stored and utilised according to best practice management. The risk of adverse effects on water quality in the Waimatuku Surfacewater Management Zone, groundwater and soils is minor.

Management of wintering barn and supporting effluent management system

The barn and supporting effluent system are managed according to best practice management and consent conditions. Barn usage per month is described in section 6, with a maximum authorised number of 625 cows housed in the barn at any one time. The supporting effluent infrastructure is designed to meet the needs of 625 cows in the barn. Raw effluent (slurry) is stored in the pond. Slurry is applied to land at very low depth according to best practice management and consent conditions. Effluent will only be applied to land when there is sufficient soil moisture deficit and no risk of drainage, and nutrients in effluent will be taken up by plants. Less than 150 kg N/hectare will be applied from pond slurry effluent at WW1&2 dairy farm, at less than 250 kg N/hectare at a support block used for cut and carry, and recommended buffers will be adhered to when discharging effluent. The effluent discharge activity is authorised by a discharge permit issued by Environment Southland, along with conditions that are met by the applicants when operating their effluent management system. This gives the Consent Authority certainty regarding the operation and management of effluent from the feed pad/lot.

Through appropriate management of the wintering barn and supporting effluent management infrastructure, the risks of adverse effects on water quality in the Waimatuku Surfacewater Management Zone, Waimatuku Groundwater Zone and soil health due to the use of land for a wintering barn, are considered as minor. In fact, the use of land for a wintering barn provides accommodation for up to 625 cows when otherwise they would be intensively winter grazed on fodder crop. It provides for a reduction in the number of cows being intensively winter grazed in the catchment and for less soil damage from pugging of soils over winter and in the shoulders of the season.

Conclusion

The use of land for an existing feed pad/lot has been considered in terms of key pSWLP policies and based on this assessment should be granted. Effects on the existing environment have been considered and are described in the above assessment. The feed pad/lot was designed, constructed, sited, and is operated to manage to avoid or mitigate risks to water quality and soil health. The assessment concludes that effects on receiving surfacewaters, groundwater and soils, including cumulatively, will be less than minor due to the use of land for the existing WW1 unit feed pad/lot at WW1&2 dairy farm.