

5 April 2022

**Southland Regional Council**  
**PO Box 903**  
**INVERCARGILL 9840**

By email: [esconsents@es.govt.nz](mailto:esconsents@es.govt.nz)

Attention: Consents Team

To Whom it May Concern

### **CAPIL GROVE FARM 444 CONSENT APPLICATION**

Capil Grove – (CG) operates a dairy support property in Springhills, Southland. In late 2021 and early 2022, the Applicants purchased two neighbouring properties to their dairy support property which has provided the opportunity to convert to dairy farming. The associated consent applications are attached.

The applicants propose to dairy farm in a different way to a typical dairy farming operation using wintering barns during winter and cold and/or wet weather, buying in cull cows as replacements instead of rearing replacements from calves, not intensely grazing over winter and many good management practices to ensure the nutrient losses and negative environmental effects are less than the previous combined operations of the combined farms. A summary of this farming system is attached.

Also attached are application documents and Assessments of Effects on the Environment (AEE's) to seek consents for:

- A Variation to Discharge Permit AUTH-20211143-02 – To allow for dairy shed effluent to be applied to the property and change in hectares that can receive effluent;
- A Variation to Land Use Consent AUTH-20211143-03 – To Increase storage pond to 17,800 m<sup>3</sup> and change location of proposed new pond to be installed
- A Variation to Land Use Consent AUTH-20211143-04 – To allow for the use of TWO wintering barns for up to 956 cows. Total area combined 8,240m<sup>2</sup>;
- A Land Use Consent for the Conversion to Dairying; and
- A Consent for the Taking of Groundwater. replacement discharge consent of 35 years for the Takapau wastewater discharge and to seek land use consent for the land application site. Proposed consent conditions and accompanying documentation will be provided.

Please contact myself or Hamish Lowe at Lowe Environmental Impact (phone 06 359 3099 or email [hamish@lei.co.nz](mailto:hamish@lei.co.nz)) if you require any further information.

Yours sincerely,



## CAPIL GROVE FARM 444 CONSENT APPLICATION

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### Low Environmental Impact

Victoria Jones  
[victoria@lei.co.nz](mailto:victoria@lei.co.nz)

### Copy to:

- » Nelson Lindsay – [nelsonl@wintonstockfeed.co.nz](mailto:nelsonl@wintonstockfeed.co.nz)
- » Carl Lindsay – [carl@arlake.co.nz](mailto:carl@arlake.co.nz)
- » Blake Lindsay – [blake@arlake.co.nz](mailto:blake@arlake.co.nz)

### Enclosures:

- » Farm 444 Article: *Increasing Production and Decreasing Environmental Effects – New Thinking to Make a Difference*
- » Capil Grove Farm 444 Application AEE
- » Part A Application Form
- » Part B Application for the Take of Groundwater
- » Section 127 for the Variation of Discharge Permit AUTH-20211143-02, Land Use Consent AUTH-20211143-03 and Land Use Consent AUTH-20211143-04.
- » Certificate of Incorporation
- » Overseer Nutrient Budget Report – Stage 0 Baseline All Farms
- » Overseer Nutrient Budget Report – Stage 3 Proposed Dairy with Lease
- » Overseer Nutrient Budget Report – Stage 4 Proposed Dairy without Lease



## **CAPIL GROVE FARM 444 CONSENT APPLICATION**

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### **Increasing Production and Decreasing Environmental Effects – New Thinking to Make a Difference**

Southland Farmers Nelson and Robyn Lindsay are pathing the way on a new approach to sustainable dairy farming, and it's with the use of cull cows.

Increasing environmental pressures are placing limitations on traditional farming methods to increase production and farm profitability. While most environmental mitigations adopt new technologies, the Lindsay's have found a solution through milking cull cows year-round rather than rearing replacement cows, and without compromising production or profitability.

### **Background**

The Lindsay's owned approximately 120 hectares of dairy support farmland in the Springhills area in 2019. Over the next two years they were presented with opportunities to buy additional neighbouring land with the block increasing to 340 hectares. One of the properties had a wintering barn and a dairy shed which had been used for sheep milking. Dairy Farming seemed the obvious choice for the newly acquired combined properties, especially with the wintering barn and dairy shed. While the Lindsay's were already dairy farming on their current farm, they wanted to do things differently and make sure the impact of their dairy platforms would be less than the current combined farming systems. This included not only the amount of nutrients leached to the environment, but also in a wholistic farm management sense.

### **Replacements**

Typical dairy farm systems see replacement cows raised from calves before becoming in-calf heifers and then being milked following calving. At some point in their life cows are removed from the herd due to a range of reasons, such as inconsistent genetics, poor production, failure to get in calf or simply being late calvers and being out of sequence with calving with the main herd. The proposed system does away with managing replacements, and the extra grass used to grow new animals that are not milking, meaning that grass grown is used to produce milk. It also means that nutrients lost from the non-milking replacement cows can be avoided.

### **Milk Feed Efficiency**

Cows removed from a herd (cull cows) may not be ideal performers, but they often can still be valuable milkers. These cull cows are often already producing, so all the feed they consume is going into milk production. They are also often milking at a higher rate than first year heifers who are still putting energy into body growth. This approach can equate to a better efficiency as grass is used for milk production instead of replacement growth and therefore any nutrients which are lost are done so while producing milk.

### **Year-Round milking**

The cull cows can be given a second chance to get in calf with an extended mating/ calving period. "When most farmers have finished calving by October, our calving period can be pushed out until the end of November/ early December". But this isn't a disadvantage to the Lindsay's as they can milk year-round, meaning that cows not getting in calf can be milked through, or until such time they do get in calf.



## **CAPIL GROVE FARM 444 CONSENT APPLICATION**

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### **Lower Slaughter Rates**

“We can put the late calving cows back in the mating herd by January and 80% of those cows get pregnant and are now in sync with the rest of the herd”. As a result, less cows are slaughtered.

### **Wintering Barn Benefits**

In combination with cull cows, the wintering barns allow the Lindsay's to keep cows off the pasture in winter and during the wetter months. The generated effluent from the cows is captured and sent to the effluent pond where it is stored and applied in the growing season, providing nutrients to the pasture. There is no intensive winter grazing taking place on the property. Supplements can be grown during the drier, warmer months and fed in the wintering barn, reducing both wastage of the feed and nutrients leached onto the paddock. And if that wasn't enough, the barns provide an opportunity to capture rainwater to be used on farm, reducing the amount of water required to be sourced elsewhere.

### **The Environmental Benefit**

The combination of the above actions can see more milk produced per hectare of property, and with a lower leaching rate. This is in addition of other farm environmental mitigation practices, such as grazing management, waterway protection and standoff facilities. When compared to the existing collective of farms being incorporated as part of this project, there is an improvement from the reduction of intensive sheep and beef grazing and dairy support.

# Application for Resource Consent (PART A)



This application is made under Section 88 of the Resource Management Act 1991

The purpose of this Part A form and the relevant Part B form(s) is to provide applications with guidance on information that is required under the Resource Management Act 1991. Please note that these forms are to act as a guide only, and Environment Southland reserves the right to request additional information.

To: Environment Southland  
Private Bag 90116  
**Invercargill 9840**

**Full name, address and contact details of applicant (in whose name consent is to be issued)**

Name: Capil Grove Limited

Address: 27 Capil Road, Grove Bush, 9827

Email: Carl@arlake.co.nz

Phone: 02102788033 Fax: \_\_\_\_\_  
*Preferred Additional*

Date(s) of birth: \_\_\_\_\_

**Consultant contact details (if different from above)**

Contact name/agent: Victoria Jones, Hamish Lowe

Address: 441 Church St, Palmerston North

Email: victoria@lei.co.nz, hamish@lei.co.nz

Phone: 06 359 3099 Fax: \_\_\_\_\_  
*Preferred Additional*

**Please tick the box for the consent(s) you are applying for and complete the relevant Part B form(s) where available:**

**Land Use**

- Bore/well
- New or expanded dairy farming
- Effluent storage
- Cultivation
- Tree planting
- Gravel extraction
- Feed-pad, wintering pad, calving pad or silage pad
- Riverbed activity
- Bridges and culverts

**Discharge**

- To air
  - To water
  - To land
- Water**
- Take and use surface water
  - Take and use groundwater
  - Dam water
  - Divert water

**Coastal**

- Whitebait stand
- Structures/occupation of space
- Removal of natural materials
- Disturb foreshore/seabed
- Discharge/deposit substances
- Commercial surface water activity
- Reclaim/drain foreshore/seabed
- Marine farming
- Other coastal activities

1 Are there any **current** or **expired** consents relating to this proposal?

Yes  No

If yes, please provide consent number(s) and description:

The following consents have been applied for variation and in conjunction with this application:  
Discharge permit AUTH-20211143-02 to discharge wintering barn effluent to land, Land use consent AUTH-20211143-03 to construct, maintain and use a 17,800 m<sup>3</sup> effluent storage pond and Land Use Consent AUTH-20211143-04 to allow for two wintering barns.

2 Are any other consents required from Environment Southland or **other authorities**?

Yes  No

If yes, please state the relevant authority and the type of consent(s) required:

As above only variation to current consents from Environment Southland

3 For what **purpose** is this consent(s) required: (e.g. discharge of effluent, gravel extraction etc.)

Land use consent: Use of land for a 450 cow dairy milking operation and for a groundwater take up to 85.8 m<sup>3</sup>/day at a rate of 2 L/s

4 **Location** of proposed activity

Address: 444 Springhills-Tussock Creek Road

Part Lot 2 DP 2005, Lot 1 DP 12811, Section 298 Forest Hill HUN, Lot 2 DP 13790, Lot 1 DP 4795, Section 517 Forest Hill HUN, Lot 3 DP 13790 and Lot 1 DP 13793

Map Reference (NZTM 2000):

E 1249823

N4872356

5 The name and address of the **owner /occupier**: (if other than the applicant)

Name: N W and R J Lindsay Phone: 0274355176

Address: 27 Capil Road, Grove Bush, 9872

**6 Please attach a map or a coloured aerial photograph, showing at a minimum, the location of the proposed activities.**

Please see AEE

## 7 Assessment of effects on the environment (AEE)

Please complete the applicable Part B form(s) for the proposed activities. For those activities where no Part B form is available, please attach a written statement that assesses the effects that your activities may have on the environment. An assessment of effects **must** include the following information:

- (a) *if it likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity;*
- (b) *an assessment of the actual or potential effect on the environment of the activity;*
- (c) *if the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment that are likely to arise from such use;*
- (d) *if the activity includes the discharge of any contaminant, a description of—*
  - (i) *the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
  - (ii) *any possible alternative methods of discharge, including discharge into any other receiving environment;*
- (e) *a description of the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help or prevent or reduce the actual or potential effect;*
- (f) *identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any persons consulted;*
- (g) *if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved;*
- (h) *if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).*

You should also include:

- (a) *an assessment of the activity against any relevant provisions of any relevant objectives, policies, or rules;*
- (b) *any information specified to be included in the application in accordance with the relevant regional plan;*
- (c) *for an application to replace an existing consent, an assessment of the value of the investment of the existing consent holder:*

An assessment of effects **must** address the following matters:

- (a) *any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects;*
- (b) *any physical effect on the locality, including any landscape and visual effects;*
- (c) *any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity;*
- (d) *any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations;*
- (e) *any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants;*
- (f) *any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.*

Please see Part A Form and AEE.



## 8 Affected Parties

Please attach written approval from parties who may be affected by your activity. *Written Approval of an Affected Party* forms are available on the Environment Southland website. During the processing of your application, Council may determine that additional approvals are required.

## 9 Site visit from the Consents Team

Consents staff are able to meet with you, visit your site and see what you are proposing to do. We find that this is beneficial to everyone involved. The cost of the visit will be included in the total cost of processing your consent. We find that applications that have an on-site visit are processed with less congestion and at a similar or lesser overall cost. We will contact you if we consider a site visit to be advantageous in processing your application.

## 10 How much will it cost to process my application?

The cost of a consent depends on the complexity of the activities. Staff time is charged out at a rate of \$145/hr and vehicle use for site visits is charged at \$0.73/km (inclusive of GST).

The fees shown below under section two are **deposits to be paid at the time of application**. Due to the complexity of these activities, this deposit will not usually cover the full cost of processing the application. **Further costs may be incurred** relating to staff time, disbursements, legal charges, consultation fees, and hearing commissioner fees. Environment Southland's User Charges and Fees document is available at:

[www.es.govt.nz/fees-and-charges](http://www.es.govt.nz/fees-and-charges)

When the consent has been processed you will receive an invoice for an additional fee, or for a refund.

The Council's user charges are fixed under Section 36 of the Resource Management Act 1991. Our fee schedule is:

<b>1. Fixed fee:</b>	
Bores and wells	<b>\$303</b>
Whitebait stand	<b>\$230</b>
<b>2. Deposit:</b>	
All other non-notified applications including: <ul style="list-style-type: none"><li>• Certificates of compliance</li><li>• Changes to consent conditions (variations)</li><li>• Change of lapse date</li></ul>	<b>\$1,500</b>
Applications that require notification or limited notification	<b>\$2,000</b>

### **How to pay**

Environment Southland accepts payment in the forms of cash, Eftpos, cheque, or electronic transfer. All electronic transfers must include the applicant's name and "consent application" as a reference. Please make electronic payments to: Environment Southland, 01-0961-0018998-00.

### User Charges

Please note that additional Annual User Charges will apply to all consents. These are payable in advance on the first day of July each year. Tables 4, 5 and 6 of the Environment Southland User Charges and Fees Schedule outlines the fees associated with Annual Administration Charges and Annual Consent Monitoring and Inspection Charges. Table 7: Annual Research and Monitoring Charges applies only to surface and groundwater takes and comprises the following:

- **Surface water takes (per consent, for volumes up to 50,000 m<sup>3</sup>/day):**
  - A charge of **\$2.08** per year per cubic metre authorised as a maximum daily take.
  - Minimum of **\$138**, maximum of **\$8,363.00**.
- **Surface water takes (per consent, for volumes over 50,000 m<sup>3</sup>/day):**
  - **\$0.0031** per cubic metre authorised as a maximum daily take.
- **Groundwater takes (per consent):**
  - A charge of **\$0.98** per year per cubic metre.
  - Minimum of **\$162**, maximum of **\$1,965.00**.

Municipal and stock water discount (of 50%) no longer applies.

### 11 Checklist: Have you included the following?

- |                                     |                                                                                                                          |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Payment of the required deposit ( <i>see fee schedule</i> )                                                              |
| <input type="checkbox"/>            | Written approval from all potentially affected parties ( <i>forms available from the Environment Southland website</i> ) |
| <input checked="" type="checkbox"/> | Site plan/location map/sketch of the proposed activity                                                                   |
| <input checked="" type="checkbox"/> | A copy of the Certificate of Incorporation ( <i>where applicant is a company</i> )                                       |
| <input checked="" type="checkbox"/> | Part B form(s) specific to your activity and/or a separate assessment of environmental effects (AEE)                     |

Note:

- (a) *If your application does not contain the necessary information and the appropriate fee, Environment Southland must return the application.*

### Signature of applicant

***I hereby certify that to the best of my knowledge and belief, the information given in this application is true and correct.***

***I undertake to pay all actual and reasonable application processing costs incurred by Environment Southland.***

Name (block capitals) CARL LINDSAY

Signed

CLindsay

Date

1/4/22

***(Signature of applicant or person authorised to sign on behalf of applicant)***

# Application for a Water Permit (PART B) - To Take and Use Groundwater

This application is made under Section 88 of the Resource Management Act 1991

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**A complete Part A form needs to be provided with this Part B form.** The purpose of this Part B form is to provide applicants with guidance on information that is required under the Resource Management Act 1991. These forms are to act as a guide only and Environment Southland reserves the right to request additional information. **Please also refer to Appendix A of the Regional Water Plan for Southland, 2010 AND Appendix L of the proposed Southland Water and Land Plan 2018.**

## **How much will it cost to process my application?**

Environment Southland's User Charges and Fees document is available at:

[www.es.govt.nz/fees-and-charges](http://www.es.govt.nz/fees-and-charges)

## ***User Charges***

Please note that additional Annual User Charges will apply to all consents.

## ***How to pay***

Environment Southland accepts payment in the forms of cash, Eftpos, or electronic transfer. All electronic transfers must include the applicant's name and "consent application" as a reference. Please make electronic payments to: Environment Southland, 01-0961-0018998-00 or online at [www.es.govt.nz/online-services/online-payments](http://www.es.govt.nz/online-services/online-payments).

To: Environment Southland  
Private Bag 90116  
**Invercargill 9840**

## **1 What is this application for?**

A new groundwater take

2 What duration of resource consent is sought? 10 years

3 For what purpose(s) will the water be used?

Stock water and dairy shed use

4 Please provide details of the bore(s) from which you wish to take water. If you do not have an existing bore, you will need to apply for a consent to construct a bore before you apply to take groundwater. Please refer to the relevant Part B form.

Bore 1: NZTM 2000 1250135 E 4871243 Bore number: No number – Spring  
Bore 2: NZTM 2000 ..... E ..... Bore number: \_\_\_\_\_

	Bore depth (m)	Top Screen depth (m)	Diameter (mm)	Pump type	Pump capacity (l/s)
Bore 1	NA – spring				
Bore 2					

5 How much water do you propose to take and at what rate will it be taken?

Maximum rate of take \_\_\_\_\_ litres per second  
Maximum daily volume 85.8 cubic metres per day  
Maximum weekly volume \_\_\_\_\_ cubic metres per week  
Maximum monthly volume \_\_\_\_\_ cubic metres per month  
Maximum annual volume \_\_\_\_\_ cubic metres per year

6 What is the frequency of the proposed water take?

How many hours per day (maximum)? 24 Until daily volume is reached  
How many days per week (maximum)? 7  
How days per month (maximum)? Up to 31

**7 Please state the name of the aquifer that you propose to take water from.**

Makarewa

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**8 Do you intend to store your water before subsequent use?**

If yes, what/how much storage will be provided? Yes – There are twenty-seven 30 m<sup>3</sup> freshwater tanks already on site

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What type of storage facilities are proposed?

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*You may need a building permit and/or additional resource consents for the construction of storage facilities.*

**9 What type of water metering system is installed or proposed to be installed?** Environment Southland prefers all takes for 5 l/s or more to be fitted with telemetry to report in line with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

Water meter

**10 If you propose to use water for stock and/or dairy shed use – please answer the following:**

(a) What type of animal and numbers of stock will be supplied with water for drinking?

650 dairy cows at 70 litres/head/day

(b) How much water do you require for your dairy shed?

50 litres/head/day

**11 If you propose to use water to irrigate land – please answer the following:**

(a) How many hectares of land will be irrigated? \_\_\_\_\_

(b) What is the soil type(s) of the land being irrigated \_\_\_\_\_

(c) What will you be irrigating (i.e. crop, pasture etc)? \_\_\_\_\_

(d) What type of irrigation system will be used? \_\_\_\_\_

(e) What is the target application rate (mm/day and mm/year)? \_\_\_\_\_

(f) How have you calculated the amount of water you need? (attach separate pages if required)

\_\_\_\_\_

**12 If you propose to use water for industrial use – please answer the following:**

(a) What type of industry will be using the water and how will the water be used?

\_\_\_\_\_

(b) How have you calculated the amount of water you need? (attach separate pages if required)

\_\_\_\_\_

**13 If you propose to use water for commercial/domestic supply – please answer the following:**

(a) What type of establishment will use the water?

	Households – number of households to be supplied: _____
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	Camping grounds – maximum number of visitors and staff per year: _____
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	Schools – maximum number of students and staff per year: _____
--	----------------------------------------------------------------

	Motel units – number and expected occupancy: _____
--	----------------------------------------------------

	Other: _____
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(b) How have you calculated the amount of water you need? (attach separate pages if required)

*Please See Application – Section 4.8*

\_\_\_\_\_

**14** | **If you propose to use water for any other purpose, please describe the amount of water you will need and how this has been calculated (please attach a separate sheet to this application, if necessary).**

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**15** | **Please describe any other sources of water available for the property. Describe how much water is available and what it is used for.**

	Rain water tanks as described above. Can also be used for general farming activities such as washing machinery, spraying and for the calfateria.
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**16** | **Please also describe any measures you are proposing to minimise wastage of water and maximise its efficient use:**

	Please see attached AEE.
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**17 Does your proposed water take have any associated discharges? If yes, please describe.**

Yes

Dairy Shed Effluent – Application includes a variation to consent AUTH-20211143-02 for the application of effluent to land from dairy shed effluent and two wintering barns.

*Please note that a discharge into the environment may require a resource consent application to be made specifically for the discharge (please refer to the relevant Part B form).*



**Existing Environment**

**18 Are any of the following features found within the existing environment of the proposed activity? Describe these features in the space below, along with details of the assessment undertaken to determine the presence of these features.**

- (a) Signs of instream life (e.g. fish, eels, bullies, crayfish, native birds, frogs)?
- (b) Areas where food is gathered from a water body (e.g. watercress, eels, wildfowl)?
- (c) Wetlands, wildlife habitats or bird nesting habitats (e.g. swamp areas)?
- (d) Other activities occurring in the area (e.g. commercial activity, fishing, swimming, boating)?
- (e) Areas of particular aesthetic, cultural, heritage or scientific value (e.g. archaeological sites)?
- (f) Waste discharges and/or monitoring sites?
- (g) Other water takes?
- (h) Surface water bodies? Natural springs?

	Yes	No
(a)		✓
(b)		✓
(c)		✓
(d)		✓
(e)		✓
(f)	✓	
(g)		✓
(h)		✓

- Discharges of FDE as per application  
 - Spring to take water from as part of this application.  
 AEE section in the application has details of assessment done (Section 6)

Please also include a map or aerial photograph showing the following:

- the location(s) of the existing points of take;
- the location of proposed points of take(s);
- the location of water measuring device(s);
- the total property area boundary;
- the area(s) to be irrigated (if relevant);
- the area(s) of community supply (if relevant);
- distances to any discharge activities;
- other surface water bodies and wetlands nearby and the distance from the point of take(s) to them;
- the coastline and the distance to it (if relevant);
- the location of any dairy sheds (if relevant).

## Assessment of Effects

19 Will the take and use of groundwater have any effects on the following:

(a) Aquifer storage volumes	No
(b) Existing bore or well yields	No
(c) River and stream flows, including minimum flows and allocation levels	No
(d) Wetland and lake water levels	No
(e) Groundwater quality	No

*For those answered **No** above, please describe why there will be no effects. For those answered **Yes**, please describe how these effects may occur.*

Please see attached AEE

**20 Pursuant to Schedule 4 of the Resource Management Act, 1991, there are a number of matters that must be addressed by an assessment of environmental effects. Please discuss what effects the proposed activity will have on the following:**

(a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects

Please see attached AEE.

(b) any physical effect on the locality, including any landscape and visual effects

Please see attached AEE

(c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity

Please see attached AEE

(d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations

Please see attached AEE

- (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants

Please see attached AEE

- (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations

Please see attached AEE

- 21** Please include a description of the monitoring or mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help avoid, reduce, remedy or mitigate the actual or potential effects on environmental features and values.

Please see attached AEE

**22 Please include a description of any possible alternative locations or methods for undertaking the activity and why these alternatives have not been selected.**

Please see attached AEE

**23 Please include evidence of any consultation undertaken for this application. This may include (but not be limited to) consultation with adjoining landowners, other consent holders in the immediate area, iwi (e.g. Te Rūnanga O Ngāi Tahu, Te Ao Marama Inc.), government departments/ministries (e.g. DOC), territorial authorities and recreational associations.**

Please see attached AEE

**24 Appendix A of the Regional Water Plan for Southland, 2010, details the level of further assessment required as part of your application. This may include the following assessments (please attach as a separate report):**

- interference effects/drawdown;
- radius of influence;
- stream depletion effects;
- an assessment of the dynamic aquifer response to abstraction.

Please see attached AEE

**25 Appendix L of the proposed Southland Water and Land Plan, 2018 details the level of further assessment required as part of your application. This may include the following assessments (please attach as a separate report):**

- aquifer test requirements;
- stream depletion effects;
- interference effects;
- calculation of seasonal groundwater allocation;
- establishing allocation volumes for confined aquifers.

Please see attached AEE

Please note that in accordance with Schedule 4 of the RMA, you must provide an assessment of whether or not the proposed activity is contrary to any of the relevant provisions of the following documents.

- (a) [Regional Water Plan for Southland, 2010](#) (and any proposed/subsequent versions)
- (b) [proposed Southland Water and Land Plan \(Appeals Version\), 2018](#) (and any proposed/subsequent versions)
- (c) [Resource Management \(National Environmental Standards for Freshwater\) Regulations 2020](#)
- (d) [National Policy Statement for Freshwater Management, 2020](#)
- (e) [Southland Regional Policy Statement, 2017](#) (and any proposed/subsequent versions)
- (f) [Resource Management \(National Environmental Standards for Sources of Human Drinking Water\) Regulations, 2007](#)
- (g) [Resource Management \(Measurement and Reporting of Water Takes\) Regulations 2010](#)

Staff are able to advise whether this is required, as it is dependent on the location, scale and complexity of your proposal. We invite you to come in for a pre-application meeting with Environment Southland consents staff to discuss this. The first half hour of assistance on any application or proposal is free of charge, with subsequent assistance being charged according to the Environment Southland's Fees and Charges Schedule.

END OF FORM



## Change (Variation) or Cancellation of Consent Conditions

This application is made under Section 127 of the Resource Management Act 1991

To: The Chief  
Executive  
Environment  
Southland DX  
YX20175  
(Private Bag 90116)  
**Invercargill 9840**

### 1. Consent Holder(s) Details

Consent Holder(s) name(s) in full: <u>Capil Grove Limited</u>	
Postal Address: <u>27 Capil Road, Grove Bush</u>	
	Post Code: <u>9827</u>
Street Address (not PO Box No):	
	Post Code: <u> </u>
Phone Number: Business: <u>02102788033</u>	Private: <u> </u>
Mobile: <u> </u>	Fax: <u> </u>
Email Address: <u>carl@arlake.co.n</u> <u>z</u>	

### 2. Contact Details (if not consent holder)

Name of Contact Person: <u>Hamish Lowe, Victoria Jones</u>	
Postal Address: <u>PO Box 4667, Palmerston North</u>	
	Post Code: <u>4442</u>
Phone Number: Business: <u>06 359 3099</u>	Private: <u> </u>
Mobile: <u> </u>	Fax: <u> </u>



**3. What is the Consent number(s) you wish to change/cancel the conditions of?**

Discharge Permit AUTH-20211143-02
Land Use Consent AUTH-20211143-03
Land Use Consent AUTH-20211143-04

**4. List the Condition/s number/s and give details of the proposed changes/cancellation.**

Discharge Permit AUTH-20211143-02 – Details of permit, Conditions 1 and Condition 2 – To allow for dairy shed effluent to be applied to the property and change in hectares that can receive effluent.
Land Use Consent AUTH-20211143-03 – General Schedule of Conditions - Conditions 1 and Condition 2 – Increase storage pond to 17,800 m <sup>3</sup> and change location of proposed new pond to be installed.
Land Use Consent AUTH-20211143-04 - Use of land for a wintering barn. Conditions throughout – Allow for the use of TWO wintering barns for up to 956 cows. Total area combined 8,240m <sup>2</sup> .

**5. Describe any adverse effects that may result from the proposed change/cancellation to the condition/s. You must include an Assessment of Environmental Effects as outlined in the Fourth Schedule of the Resource Management Act 1991. The extent of detail required should be relative to the scale and significance of the potential adverse effects the activity may have on the receiving environment.**

Please see attached Assessment of Environmental Effects – Section 6.

**6. Will the proposed change/cancellation to the condition/s result in any adverse effects that are different from those currently authorised by the consent?**

No. Please see attached Assessment of Environmental Effects – Section 6.

**7. List any parties that you consider may be adversely affected by the proposed change/cancellation.**

No affected parties have been identified.

## Declaration

In order to provide a complete application have you remembered to:

- Fully complete this application form
- Attach the required deposit.

I/we hereby certify that to the best of my/our knowledge and belief, the information given in this application is true and correct. **I/we undertake to pay all actual and reasonable application processing costs incurred by Environment Southland.**

Name/s: CARL LINDSAY  
(Block capitals)

Signature/s: Carl Lindsay  
(or person authorised to sign on behalf of applicant)

Designation:  
(e.g. owner, manager, consultant)

Date: 1/4/22

### How much will it cost to process my application?

Environment Southland's User Charges and Fees document is available at: [www.es.govt.nz/fees-and-charges](http://www.es.govt.nz/fees-and-charges)

#### User Charges

Please note that additional Annual User Charges will apply to all consents.

#### How to pay

Environment Southland accepts payment in the forms of cash, Eftpos, or electronic transfer. All electronic transfers must include the applicant's name and "consent application" as a reference. Please make electronic payments to: Environment Southland, 01-0961-0018998-00 or online at [www.es.govt.nz/online-services/online-payments](http://www.es.govt.nz/online-services/online-payments).

### Information Requirements

In order for any change of conditions application to be processed efficiently in the minimum time and at minimum cost, it is critical that as much relevant information as possible is included with the application. Where an application is significantly incomplete, the Consent Authority may decide not to accept the application for processing pursuant to s88 of the Resource Management Act 1991.



COMPANIES OFFICE

Certificate of Incorporation

CAPIL GROVE LIMITED

6450732

NZBN: 9429046362179

This is to certify that CAPIL GROVE LIMITED was incorporated under the Companies Act 1993 on the 20th day of September 2017.



Registrar of Companies  
20th day of September 2017



For further details relating to this company check  
<http://www.companies.govt.nz/co/6450732>  
Certificate generated 20 September 2017 09:39 AM NZST



SCAN TO VIEW  
OUR REGISTRATION DETAILS

# OVERSEER

## FARM SUMMARY REPORT

Printed date: 22 Mar 2022, 12:41PM

Printed by: Lowe Environmental Impact



31857

135 Capil Rd, Grove Bush 9872, New Zealand

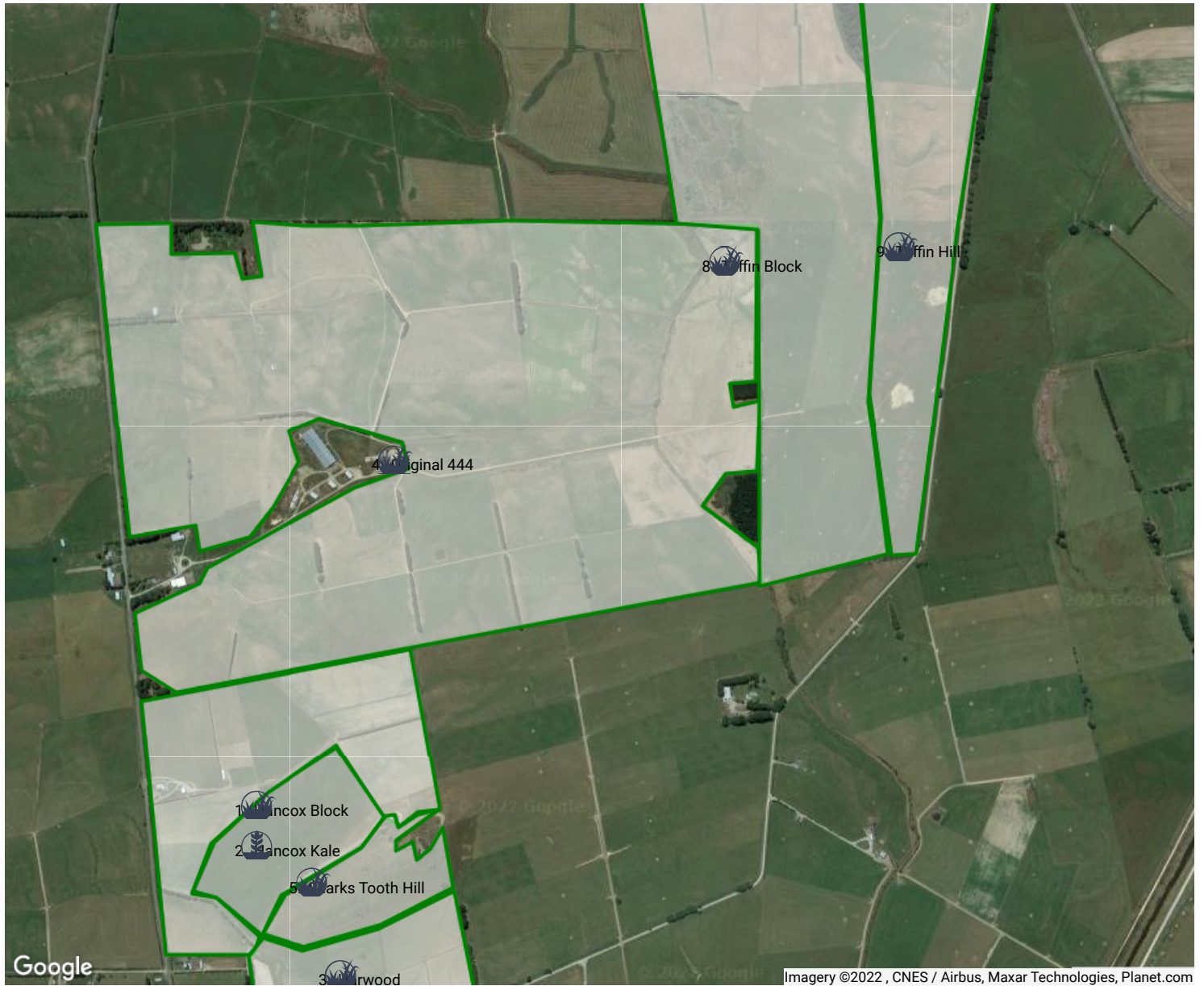
Stage 0 - Baseline - All farms

Analysis type	Scenario
Model version	6.4.2

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# FARM MAP



## GREENHOUSE GAS EMISSIONS

	STAGE 0 - BASELINE - ALL FARMS
Total GHG emissions (eCO2/tonnes/yr)	2,662.9
Methane (eCO2/tonnes/yr)	1,845.2
N2O (eCO2/tonnes/yr)	550.5
CO2 (eCO2/tonnes/yr)	267.2

## eCO2 FOOTPRINT

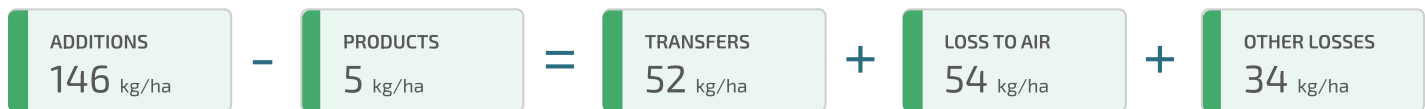
	STAGE 0 - BASELINE - ALL FARMS
Beef (kg/SU)	417
Sheep (kg/SU)	394

## NUTRIENTS

		STAGE 0 - BASELINE - ALL FARMS
Nitrogen	Total loss (kg)	11,629
	Loss/ha (kg/ha)	34
	NCE (%)	4
	N Surplus (kg/ha)	142
Phosphorus	Total loss (kg)	634
	Loss/ha (kg/ha)	1.9
	P Surplus (kg/ha)	30

## NITROGEN

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the N surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Nitrogen surplus is total additions minus product removed (141 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

## NITROGEN BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		STAGE 0 - BASELINE - ALL FARMS
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.	50
Rain/clover fixation	Nutrients from rainfall and fixation of atmospheric nitrogen by legumes/clover.	84
Supplements	Nutrients from supplements imported onto the farm.	12
Total		146

## NITROGEN REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		STAGE 0 - BASELINE - ALL FARMS
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	5
Total		5



## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

		STAGE 0 - BASELINE - ALL FARMS
<b>Organic pool</b>	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	47
<b>Inorganic soil pool</b>	Change in plant available nutrients based on soil tests.	15
<b>Root and stover residuals</b>	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	7
<b>Standing plant material</b>	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-17
<b>Total</b>		52

## NITROGEN LOST TO THE ATMOSPHERE

The nutrients lost into the atmosphere through volatilisation and denitrification.

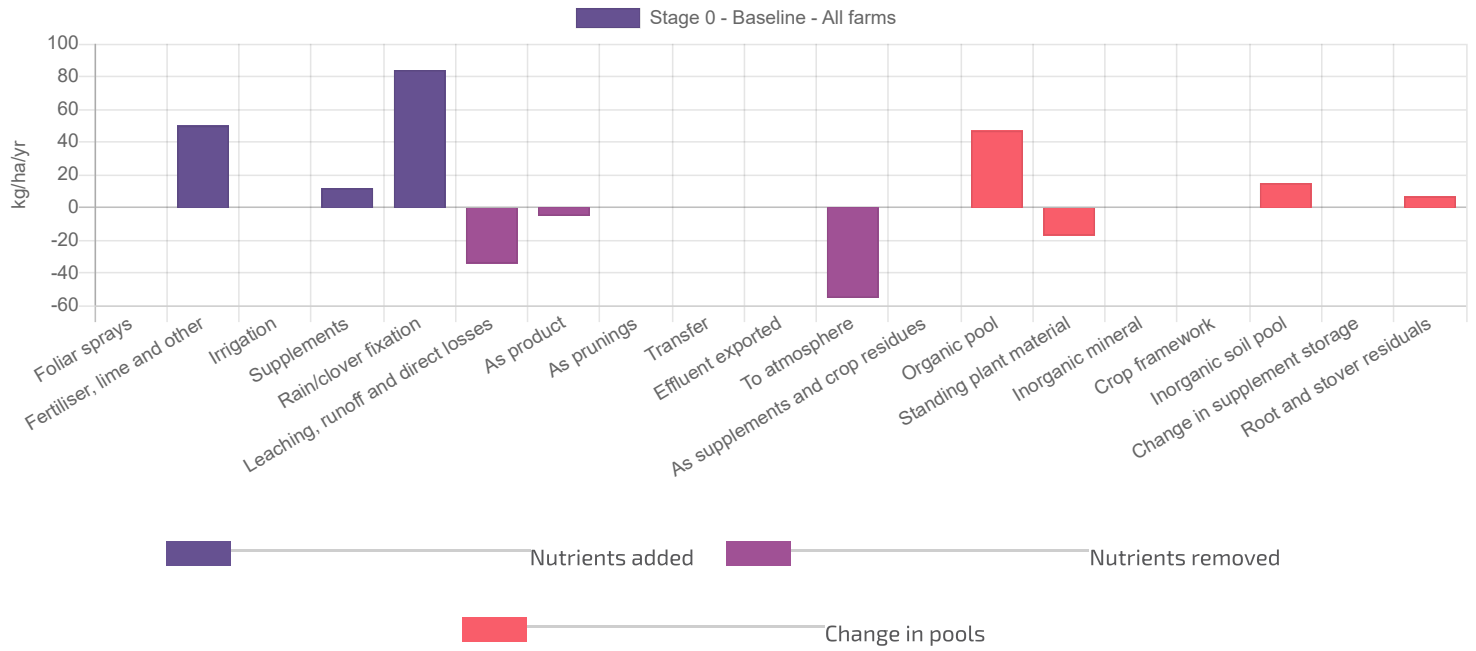
		STAGE 0 - BASELINE - ALL FARMS
<b>Denitrification - background</b>	Background conversion of nitrate to nitrogen gas.	3
<b>Volatilisation - urine</b>	Loss of nitrogen in urine to the atmosphere as ammonia.	32
<b>Denitrification - urine</b>	Conversion of nitrate from urine to nitrogen gas.	18
<b>Volatilisation - fertiliser</b>	Loss of nitrogen in fertiliser to the atmosphere as ammonia.	1
<b>Total</b>		54

## OTHER NITROGEN LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

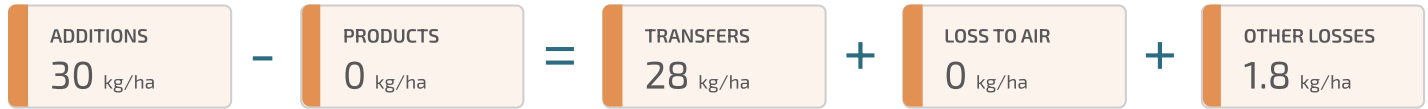
		STAGE 0 - BASELINE - ALL FARMS
<b>Leaching - urine patches</b>	Nutrients from urine that has leached below the root zone.	7
<b>Direct (animals, drains)</b>	Nutrients to water via drainage systems or directly from animals.	22
<b>Leaching - other</b>	Nutrients from other sources (not urine) that has leached below the root zone.	5
<b>Total</b>		34

## NITROGEN MOVEMENTS



## PHOSPHORUS

Nutrients are brought to the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the P surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Phosphorus surplus is total additions minus product removed (30 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

## PHOSPHORUS BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		STAGE 0 - BASELINE - ALL FARMS
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.	28
Supplements	Nutrients from supplements imported onto the farm.	2
Total		30

## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

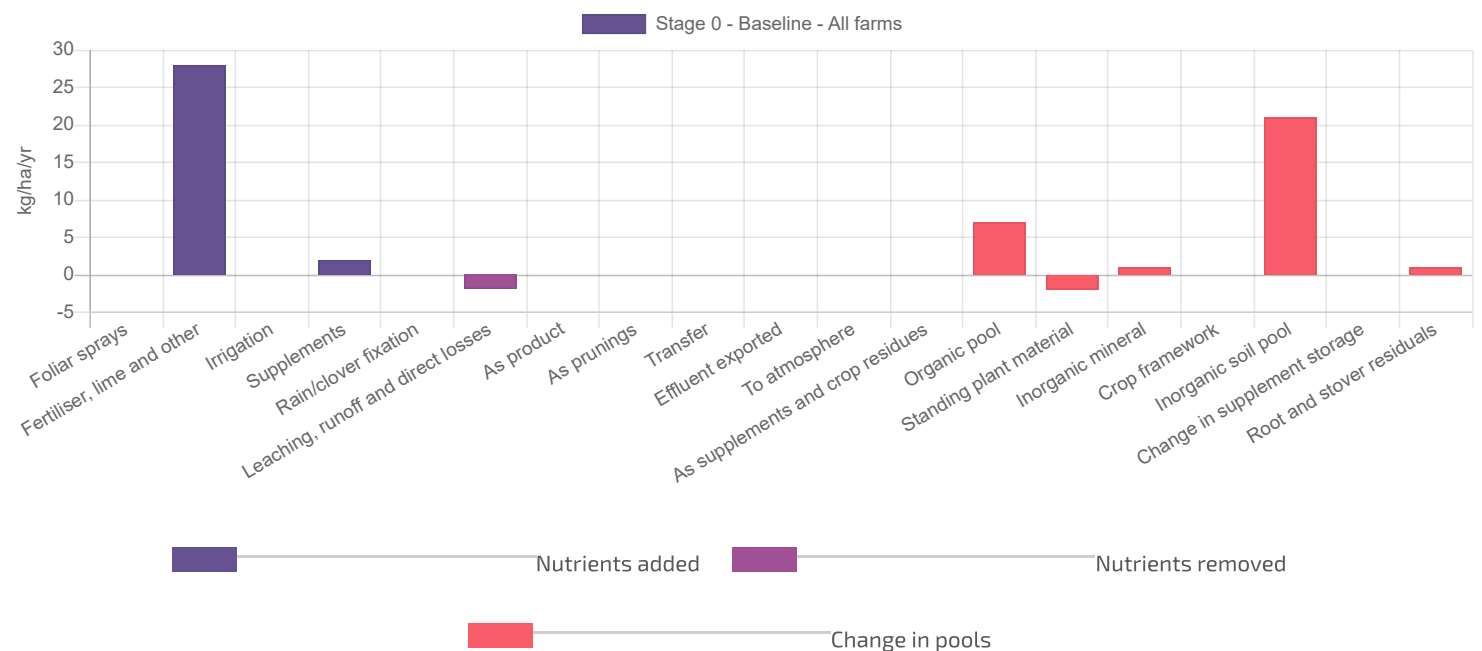
		STAGE 0 - BASELINE - ALL FARMS
Inorganic mineral	Nutrients adsorbed on (adhered to) clay minerals and undissolved lime.	1
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	7
Inorganic soil pool	Change in plant available nutrients based on soil tests.	21
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	1
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-2
Total		28

## OTHER PHOSPHORUS LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

		STAGE 0 - BASELINE - ALL FARMS
Runoff	Nutrients lossed during runoff (over land).	1.5
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	0.2
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	0.1
Total		1.8

## PHOSPHORUS MOVEMENTS



## PHYSICAL CHARACTERISTICS

		STAGE 0 - BASELINE - ALL FARMS
<b>Land area</b>	Farm area (ha)	340.1
	Productive block area (ha)	313.4
<b>Climate</b>	Average temperature (°C)	10.3
	Average rainfall (mm)	1,110
	Average PET (mm)	718

## FARM SOILS

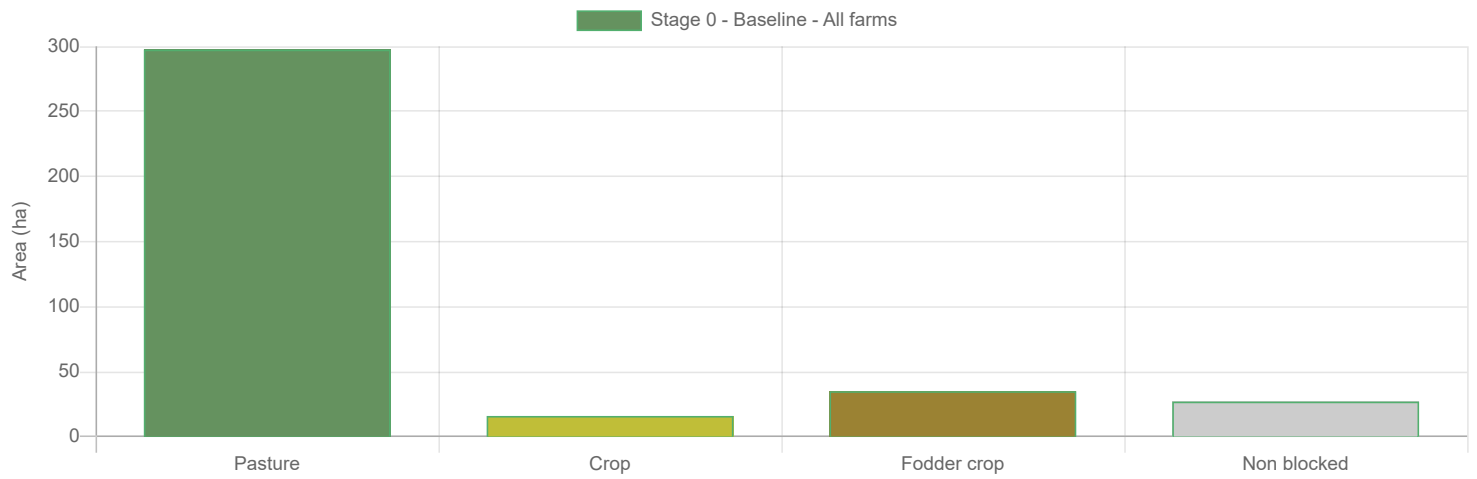
		STAGE 0 - BASELINE - ALL FARMS
<b>Recent/YGE/BGE/Pallic Pukem_6a.1</b>	Area (ha)	185.5
	Properties modified	-
<b>Sedimentary/Gley Brax_4a.1</b>	Area (ha)	16.1
	Properties modified	-
<b>Sedimentary/Gley Makar_3b.1</b>	Area (ha)	83.9
	Properties modified	-
<b>Sedimentary/Melanic Kau_7a.1</b>	Area (ha)	8.7
	Properties modified	-
<b>Sedimentary/Melanic Tamar_3a.1</b>	Area (ha)	19.2
	Properties modified	-

1 - Olsen P is calculated using soil test results, proportioned by the area of the farm that this soil covers.

## BLOCK TYPES

		STAGE 0 - BASELINE - ALL FARMS
Pasture	Area (ha)	297
	Pasture grown (T/DM/Yr)	4,691
	Pasture intake (T/DM/Yr)	3,225
	Supplements harvested (T/DM/Yr)	84
Crop	Area (ha)	16
Fodder crop	Area (ha)	35
Non blocked	Area (ha)	27
Total area	(ha)	340

## EFFECTIVE AREA BY BLOCK TYPE



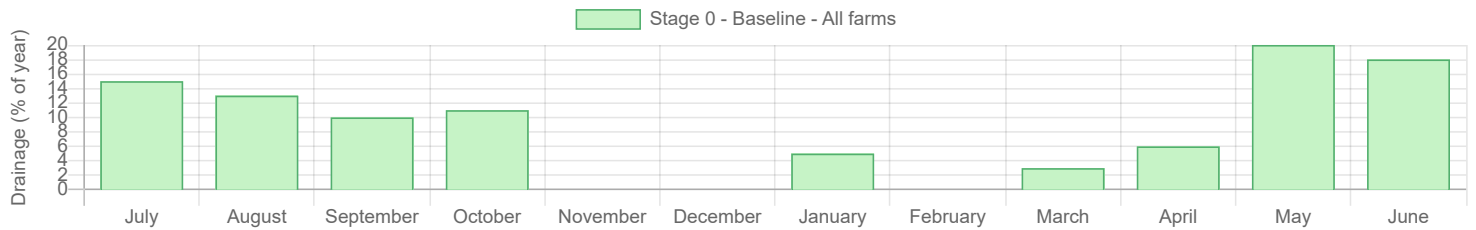
## DRAINAGE

- ! Drainage indicates the amount of water draining below the root zone of typical crops or pastures (60cm). Drainage occurs when the amount of water (from rainfall and irrigation) exceeds the water holding capacity of the soil. When water drains it can take any excess nitrogen below this root zone and so risks leaching from the farm into the water table below.

The model uses a 30 year average climate for each block's location. The following graph shows the percentage of annual drainage that occurs each month using this average climate. This provides an indication of when the highest leaching risk is for the farm when under average conditions.

		STAGE 0 - BASELINE - ALL FARMS
Drainage	Average drainage at 60cm (mm)	-
	Nitrogen concentration in water drained (ppm)	-

### WHEN DRAINAGE AT 60CM OCCURS



## WETLANDS & ARTIFICIAL DRAINAGE SYSTEMS

		STAGE 0 - BASELINE - ALL FARMS
Mole tile drainage	Area (ha)	268.7

## CROPS

		STAGE 0 - BASELINE - ALL FARMS
Ryegrass/white clover	Area (ha)	262.4
	Pasture grown (T/DM/Yr)	4,143
	Pasture intake (T/DM/Yr)	2,847
	Supplements (T/DM/Yr)	75
Kale	Area (ha)	16
	Yield (T dry matter)	192
Swedes	Area (ha)	35
	Yield (T dry matter)	474

## ANIMALS

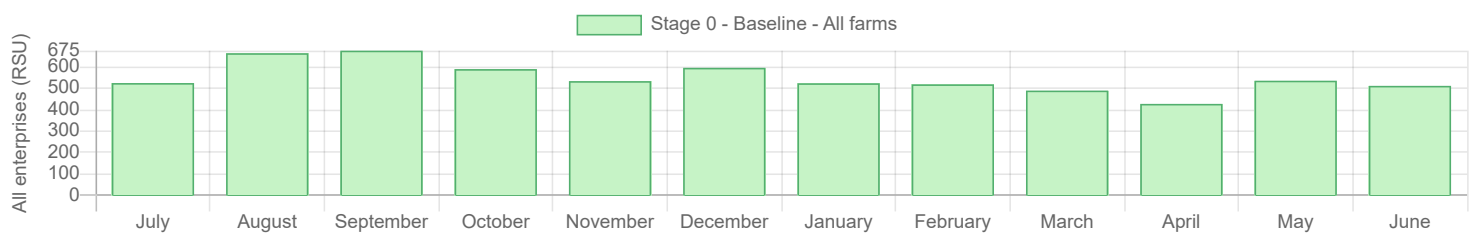
		STAGE 0 - BASELINE - ALL FARMS
RSU	Total RSU (RSU)	6,581
	RSU per farm area (RSU)	19.35
	RSU per productive area (RSU)	21
Production	Total liveweight brought (kg/ha grazed)	1,931
	Total liveweight reared (kg/ha grazed)	526
	Total liveweight sold (kg/ha grazed)	1,960
	Percent male beef animals	2

## ENTERPRISE RSU

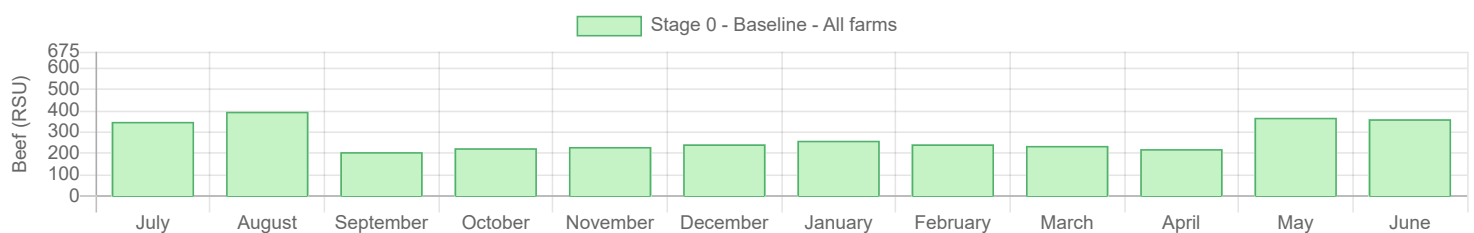
		STAGE 0 - BASELINE - ALL FARMS
Beef	Total RSU (RSU)	3,334
	RSU per farm area (RSU/ha)	9.8
	RSU per grazed area (RSU/ha)	11.22
Sheep	Total RSU (RSU)	3,247
	RSU per farm area (RSU/ha)	9.55
	RSU per grazed area (RSU/ha)	10.92

## ENTERPRISE RSU BY MONTH

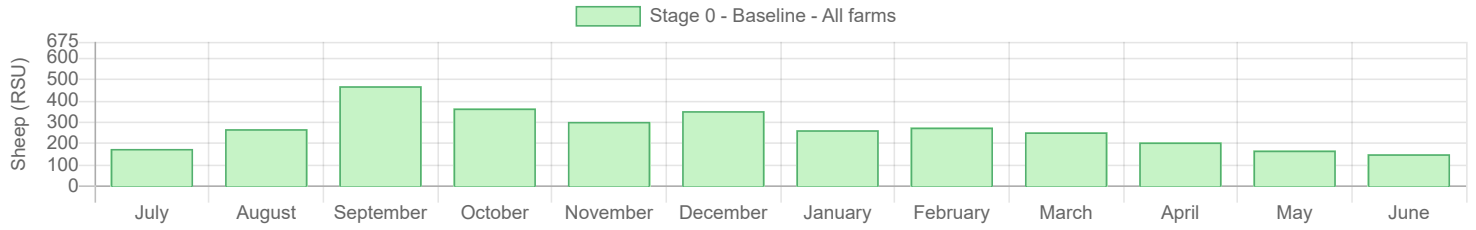
### ALL ENTERPRISES (RSU)



### BEEF (RSU)

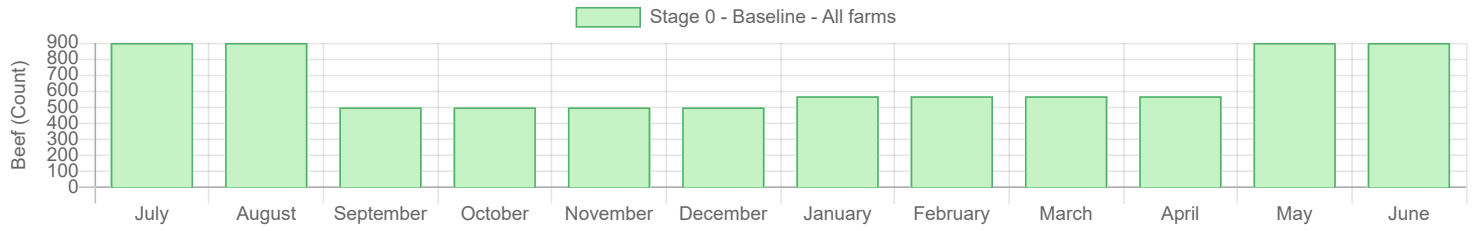


## SHEEP (RSU)

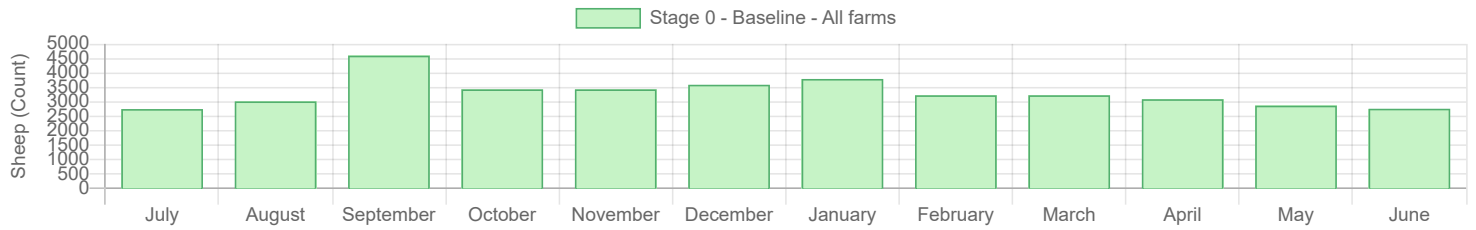


## ENTERPRISE STOCK NUMBERS BY MONTH

### BEEF (COUNT)



### SHEEP (COUNT)



! The selected analysis does not contain any structure information



## FEED

		STAGE 0 - BASELINE - ALL FARMS
RSU	Total (RSU)	6,582
	Crops (RSU)	1,120
	Pasture (RSU)	5,139
	Farm supplements (RSU)	88
	Imported fodder supplements (RSU)	235

## RSU - BEEF

		STAGE 0 - BASELINE - ALL FARMS
	Total (RSU)	3,336
	Crops (RSU)	724
	Pasture (RSU)	2,353
	Farm supplements (RSU)	24
	Imported fodder supplements (RSU)	235

## RSU - SHEEP

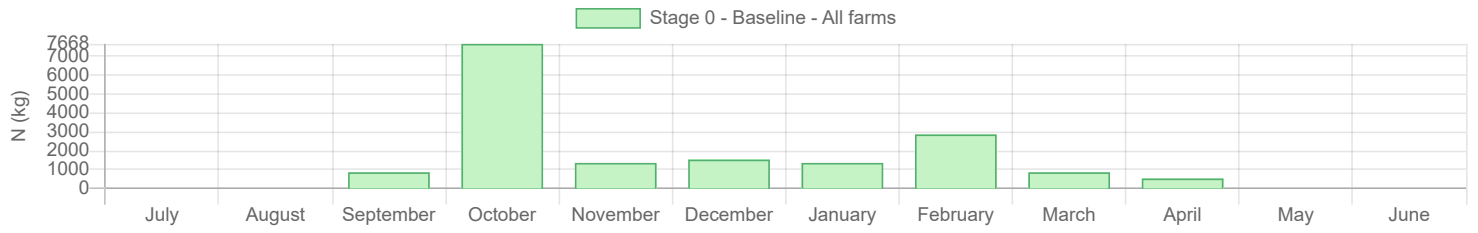
		STAGE 0 - BASELINE - ALL FARMS
	Total (RSU)	3,246
	Crops (RSU)	396
	Pasture (RSU)	2,786
	Farm supplements (RSU)	64

# FERTILISER

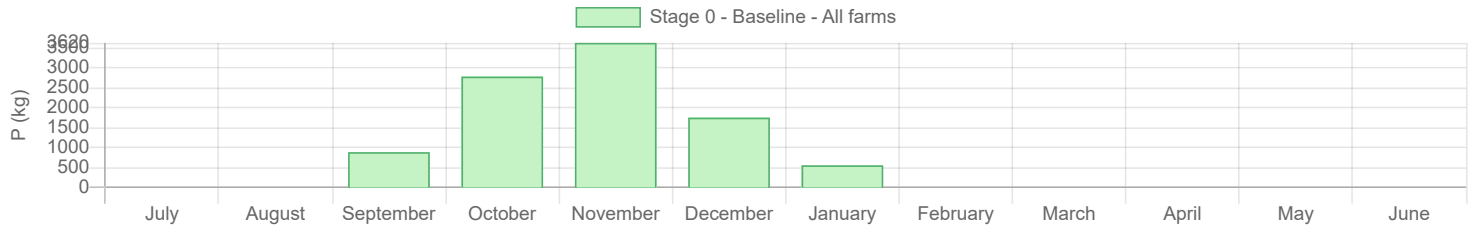
		STAGE 0 - BASELINE - ALL FARMS
Synthetic N	Pasture (kg)	13,969.555
	Pasture (kg/ha)	53
Synthetic N	Crop (kg)	1,664
	Crop (kg/ha)	104
Synthetic N	Fodder crop (kg)	1,540
	Fodder crop (kg/ha)	44
Synthetic P	Pasture (kg)	6,693.467
	Pasture (kg/ha)	26
Synthetic P	Crop (kg)	1,120
	Crop (kg/ha)	70
Synthetic P	Fodder crop (kg)	1,750
	Fodder crop (kg/ha)	50

# FERTILISER NUTRIENTS BY MONTH

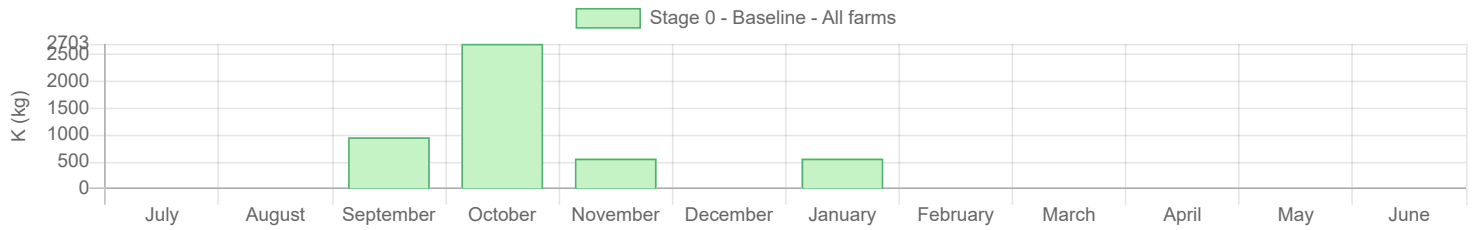
## N (KG)



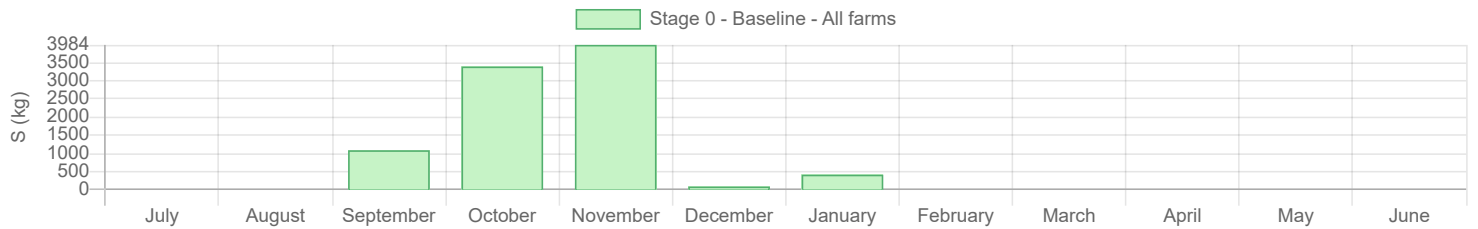
## P (KG)



## K (KG)



## S (KG)



! The selected analysis does not contain irrigation information

# OVERSEER

## FARM SUMMARY REPORT

Printed date: 22 Mar 2022, 3:33PM

Printed by: Lowe Environmental Impact



31857

135 Capil Rd, Grove Bush 9872, New Zealand

Stage 3 - Proposed Dairy Milking w/ lease

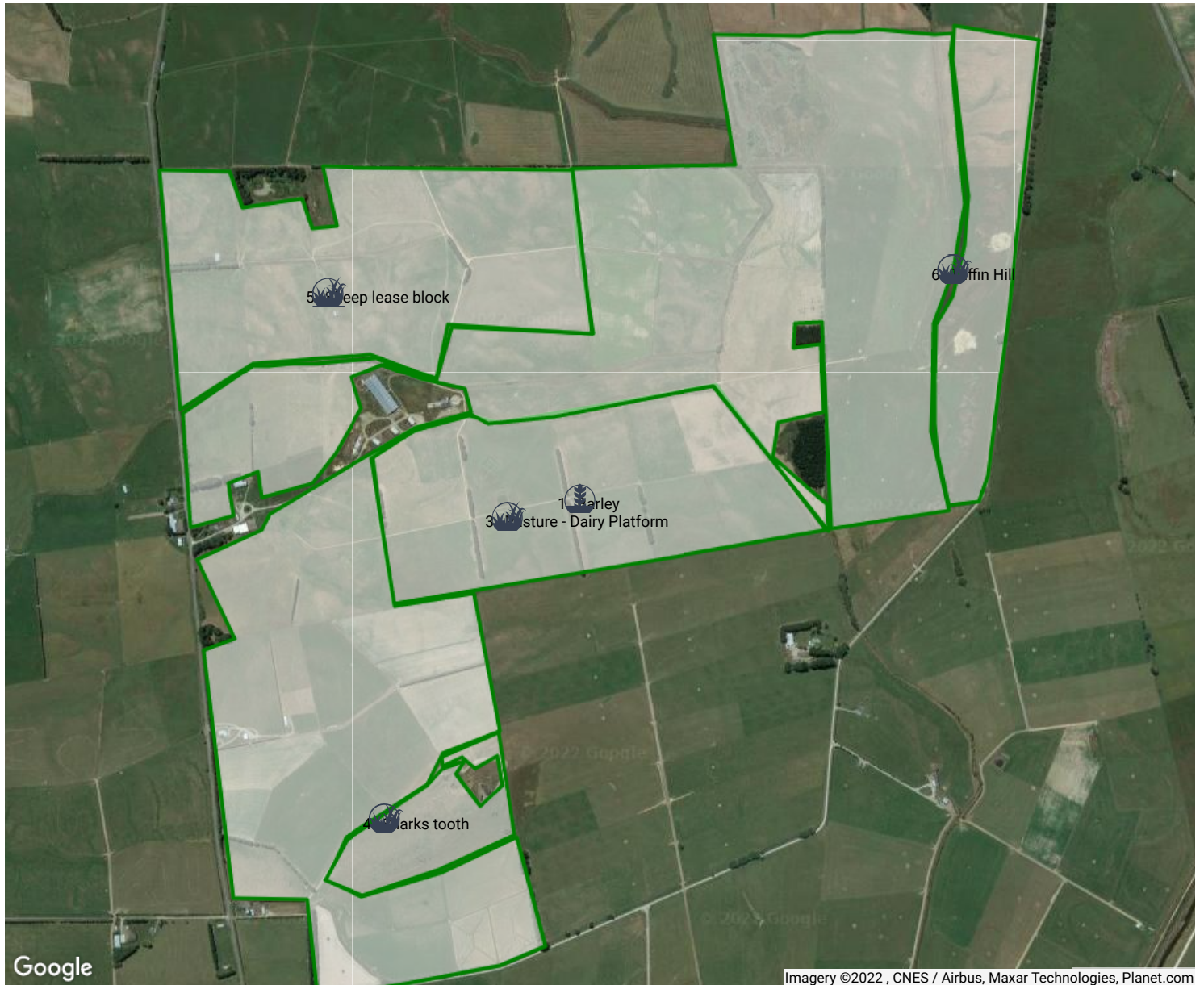
Analysis type Scenario

Model version 6.4.2

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# FARM MAP



## GREENHOUSE GAS EMISSIONS

	STAGE 3 - PROPOSED DAIRY MILKING W/
Total GHG emissions (eCO2/tonnes/yr)	4,922.5
Methane (eCO2/tonnes/yr)	3,698.5
N2O (eCO2/tonnes/yr)	525.6
CO2 (eCO2/tonnes/yr)	698.4

## eCO2 FOOTPRINT

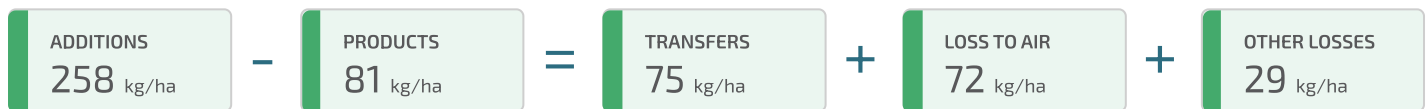
	STAGE 3 - PROPOSED DAIRY MILKING W/
Dairy (kg/cow)	8,834
Sheep (kg/SU)	397
Dairy grazing (kg/SU)	442
Vegetable/arable crops (kg/ha)	763

## NUTRIENTS

		STAGE 3 - PROPOSED DAIRY MILKING W/
Nitrogen	Total loss (kg)	9,907
	Loss/ha (kg/ha)	29
	NCE (%)	29
	N Surplus (kg/ha)	182
Phosphorus	Total loss (kg)	646
	Loss/ha (kg/ha)	1.9
	P Surplus (kg/ha)	25

## NITROGEN

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the N surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Nitrogen surplus is total additions minus product removed (177 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

## NITROGEN BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		STAGE 3 - PROPOSED DAIRY MILKING W/
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.'	95
Rain/clover fixation	Nutrients from rainfall and fixation of atmospheric nitrogen by legumes/clover.	77
Supplements	Nutrients from supplements imported onto the farm.	86
<b>Total</b>		<b>258</b>

## NITROGEN REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		STAGE 3 - PROPOSED DAIRY MILKING W/
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	75
As supplements and crop residues	Nutrients removed in supplements and crop residue exported off farm.	6
<b>Total</b>		<b>81</b>

## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

		STAGE 3 - PROPOSED DAIRY MILKING W/
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	54
Inorganic soil pool	Change in plant available nutrients based on soil tests.	37
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	14
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-30
Total		75

## NITROGEN LOST TO THE ATMOSPHERE

The nutrients lost into the atmosphere through volatilisation and denitrification.

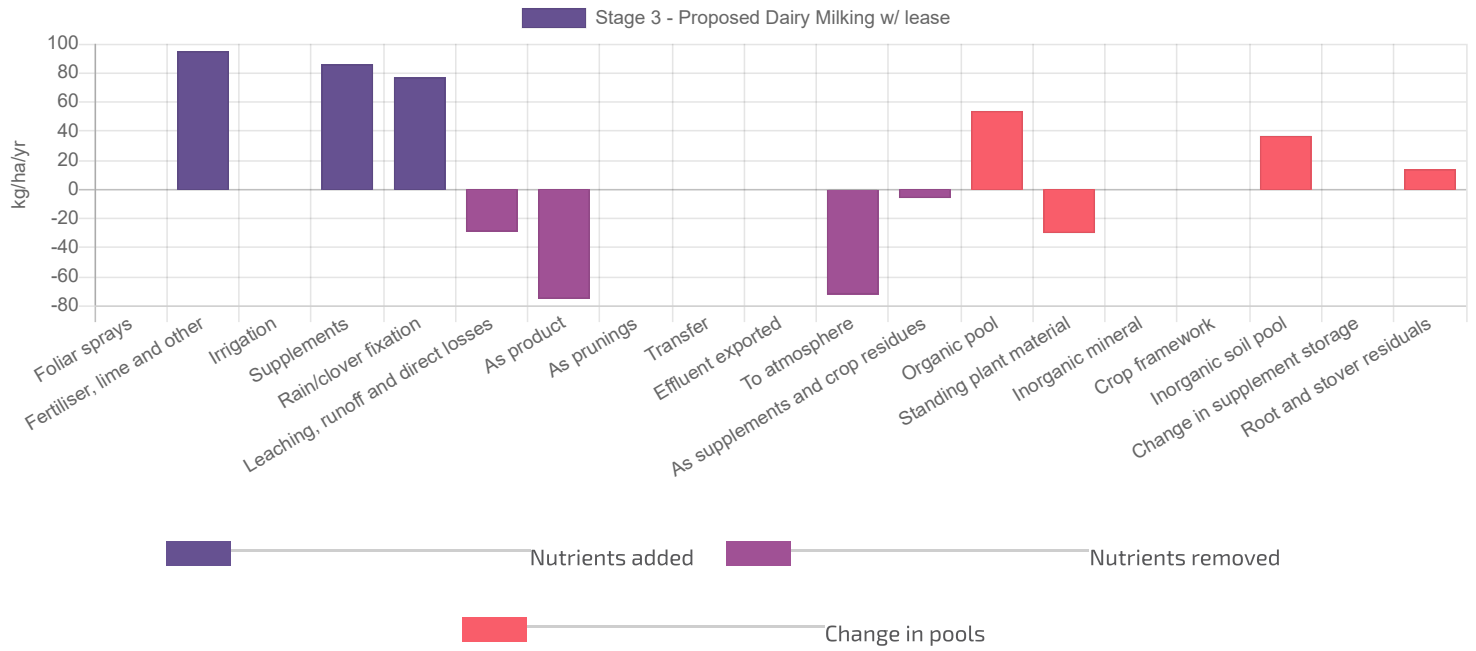
		STAGE 3 - PROPOSED DAIRY MILKING W/
Denitrification - background	Background conversion of nitrate to nitrogen gas.	9
Volatilisation - other	Background loss of nitrogen to the atmosphere as ammonia.	25
Volatilisation - urine	Loss of nitrogen in urine to the atmosphere as ammonia.	25
Denitrification - urine	Conversion of nitrate from urine to nitrogen gas.	10
Volatilisation - fertiliser	Loss of nitrogen in fertiliser to the atmosphere as ammonia.	3
Total		72

## OTHER NITROGEN LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

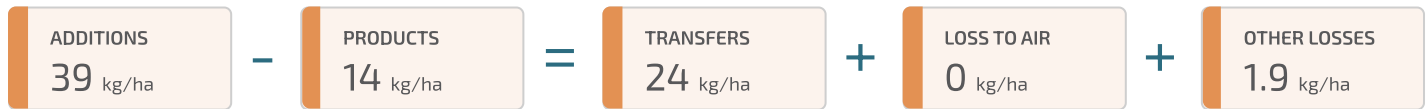
		STAGE 3 - PROPOSED DAIRY MILKING W/
Leaching - urine patches	Nutrients from urine that has leached below the root zone.	5
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	20
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	4
Total		29

## NITROGEN MOVEMENTS



## PHOSPHORUS

Nutrients are brought to the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the P surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Phosphorus surplus is total additions minus product removed (25 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

## PHOSPHORUS BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		STAGE 3 - PROPOSED DAIRY MILKING W/
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.	25
Supplements	Nutrients from supplements imported onto the farm.	14
<b>Total</b>		<b>39</b>

## PHOSPHORUS REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		STAGE 3 - PROPOSED DAIRY MILKING W/
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	14
<b>Total</b>		<b>14</b>



## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

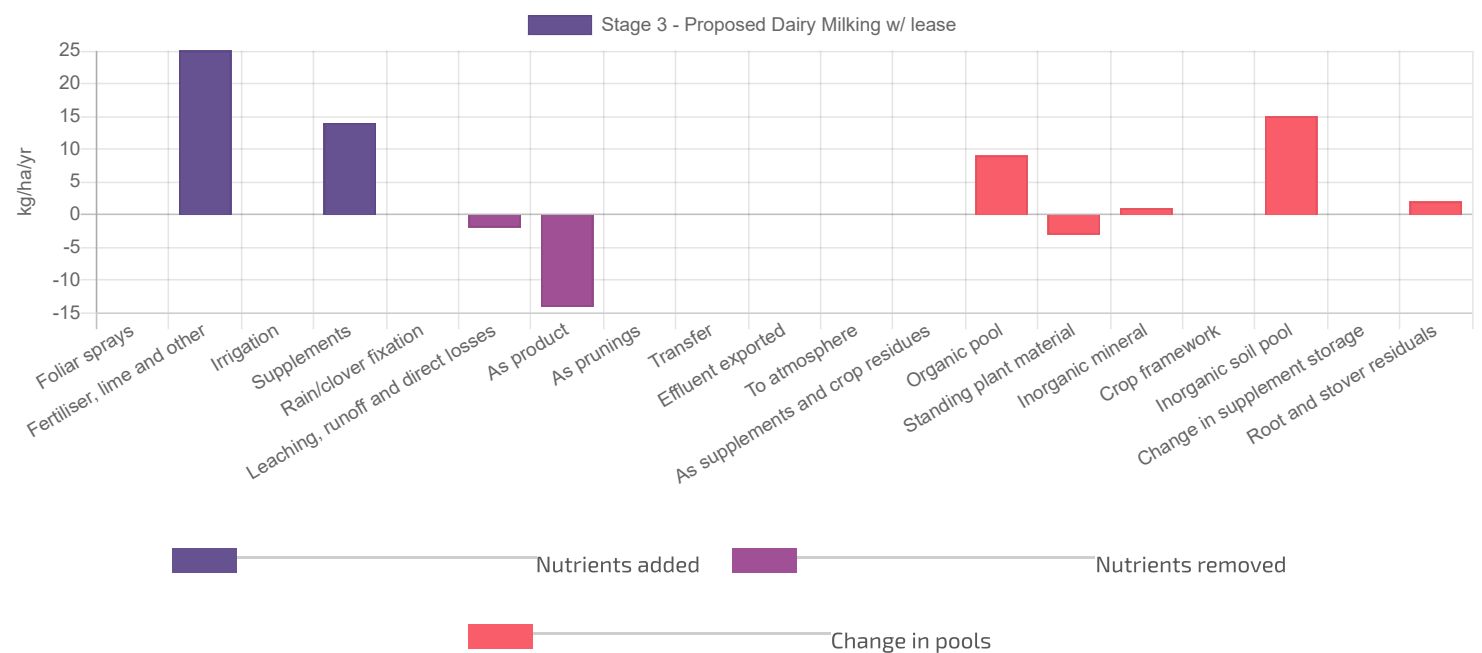
		STAGE 3 - PROPOSED DAIRY MILKING W/
Inorganic mineral	Nutrients adsorbed on (adhered to) clay minerals and undissolved lime.	1
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	9
Inorganic soil pool	Change in plant available nutrients based on soil tests.	15
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	2
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-3
<b>Total</b>		<b>24</b>

## OTHER PHOSPHORUS LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

		STAGE 3 - PROPOSED DAIRY MILKING W/
Runoff	Nutrients lost during runoff (over land).	1.4
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	0.3
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	0.2
<b>Total</b>		<b>1.9</b>

## PHOSPHORUS MOVEMENTS



## PHYSICAL CHARACTERISTICS

		STAGE 3 - PROPOSED DAIRY MILKING W/
<b>Land area</b>	Farm area (ha)	340.1
	Productive block area (ha)	313.4
<b>Climate</b>	Average temperature (°C)	10.3
	Average rainfall (mm)	1,110
	Average PET (mm)	719

## FARM SOILS

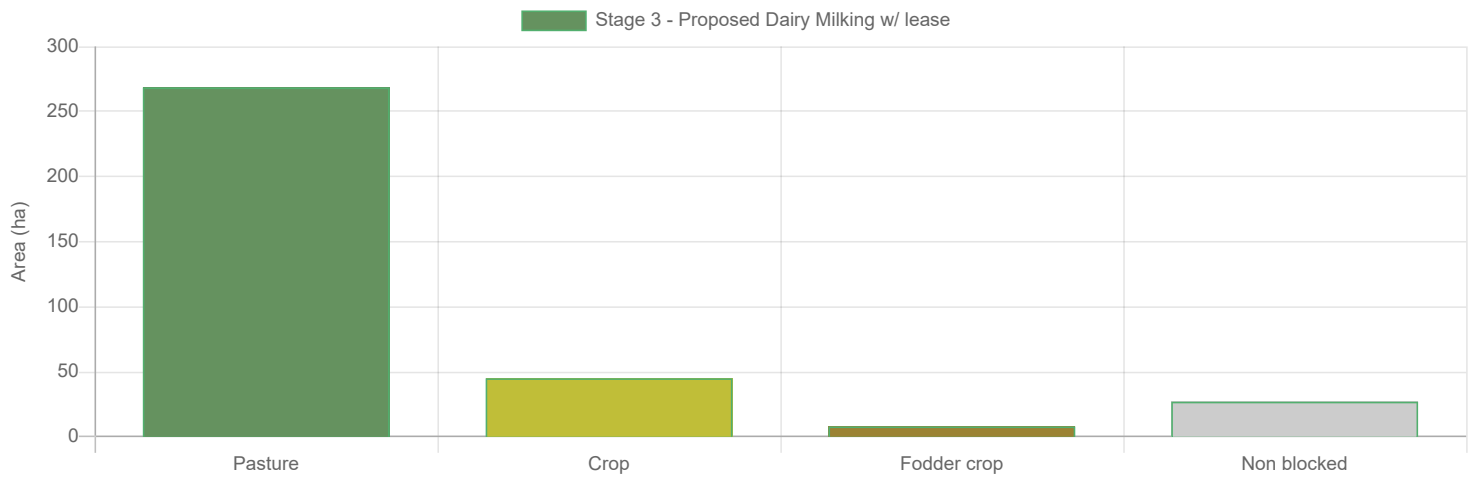
		STAGE 3 - PROPOSED DAIRY MILKING W/
<b>Recent/YGE/BGE/Pallic Pukem_6a.1</b>	Area (ha)	191
	Properties modified	-
<b>Sedimentary/Gley Brax_4a.1</b>	Area (ha)	6.6
	Properties modified	-
<b>Sedimentary/Gley Makar_3b.1</b>	Area (ha)	82.4
	Properties modified	-
<b>Sedimentary/Melanic Kau_7a.1</b>	Area (ha)	8.7
	Properties modified	-
<b>Sedimentary/Melanic Temar_3a.1</b>	Area (ha)	24.7
	Properties modified	-

1 - Olsen P is calculated using soil test results, proportioned by the area of the farm that this soil covers.

# BLOCK TYPES

		STAGE 3 - PROPOSED DAIRY MILKING W/
<b>Pasture</b>	Area (ha)	268
	Pasture grown (T/DM/Yr)	3,349
	Pasture intake (T/DM/Yr)	2,163
	Supplements harvested (T/DM/Yr)	650
<b>Crop</b>	Area (ha)	45
	Pasture grown (T/DM/Yr)	142
	Pasture intake (T/DM/Yr)	121
<b>Fodder crop</b>	Area (ha)	8
<b>Non blocked</b>	Area (ha)	27
<b>Total area</b>	(ha)	340

## EFFECTIVE AREA BY BLOCK TYPE



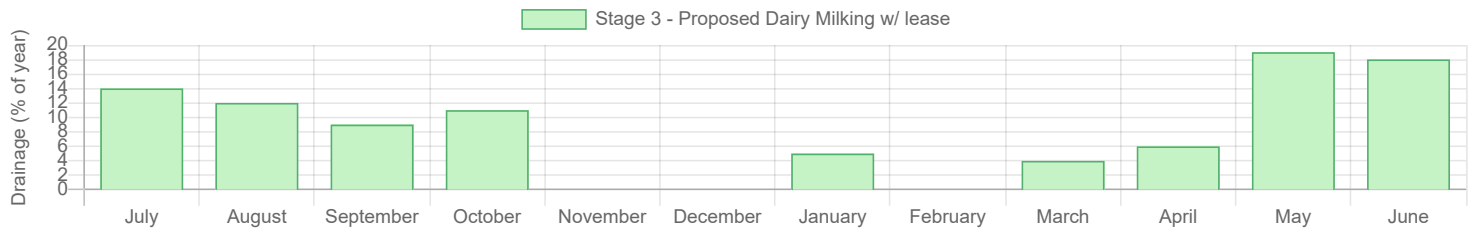
## DRAINAGE

- ! Drainage indicates the amount of water draining below the root zone of typical crops or pastures (60cm). Drainage occurs when the amount of water (from rainfall and irrigation) exceeds the water holding capacity of the soil. When water drains it can take any excess nitrogen below this root zone and so risks leaching from the farm into the water table below.

The model uses a 30 year average climate for each block's location. The following graph shows the percentage of annual drainage that occurs each month using this average climate. This provides an indication of when the highest leaching risk is for the farm when under average conditions.

		STAGE 3 - PROPOSED DAIRY MILKING W/
Drainage	Average drainage at 60cm (mm)	-
	Nitrogen concentration in water drained (ppm)	-

### WHEN DRAINAGE AT 60CM OCCURS



## WETLANDS & ARTIFICIAL DRAINAGE SYSTEMS

		STAGE 3 - PROPOSED DAIRY MILKING W/
Mole tile drainage	Area (ha)	268.7

## CROPS

		STAGE 3 - PROPOSED DAIRY MILKING W/
Ryegrass/white clover	Area (ha)	260.4
	Pasture grown (T/DM/Yr)	3,228
	Pasture intake (T/DM/Yr)	2,078
	Supplements (T/DM/Yr)	650
Barley (spring)	Area (ha)	45
	Yield (T grain)	360
Kale	Area (ha)	8
	Yield (T dry matter)	96

## ANIMALS

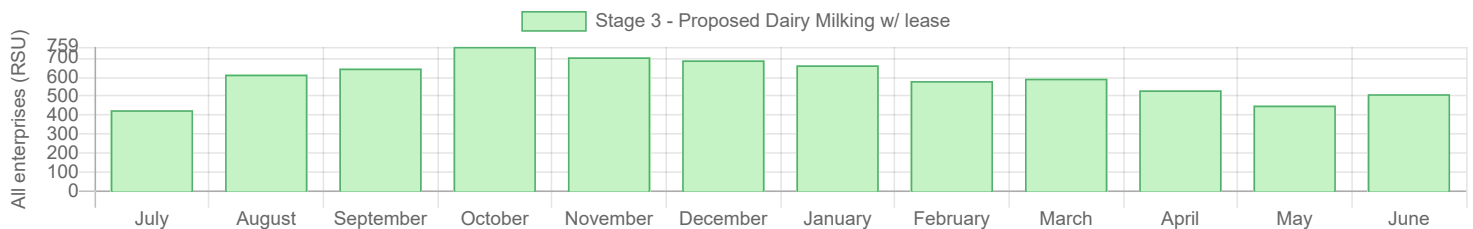
		STAGE 3 - PROPOSED DAIRY MILKING W/
RSU	Total RSU (RSU)	7,313
	RSU per farm area (RSU)	21.5
	RSU per productive area (RSU)	23.33
Production	Total liveweight brought (kg/ha grazed)	1,002
	Total liveweight reared (kg/ha grazed)	140
	Total liveweight sold (kg/ha grazed)	1,077
	Milk production per cow (kg milk solids / cow)	550
	Milk solids (kg/ha grazed)	1,035
	Milking herd size (peak cows/ha grazed)	1.9

## ENTERPRISE RSU

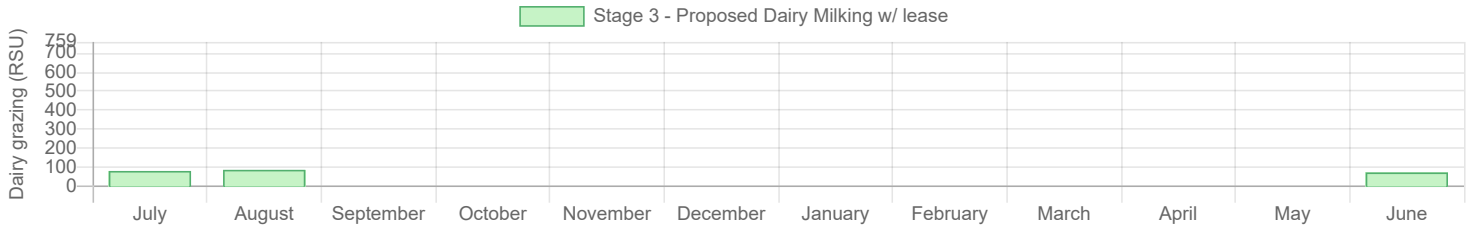
		STAGE 3 - PROPOSED DAIRY MILKING W/
Dairy grazing	Total RSU (RSU)	247
	RSU per farm area (RSU/ha)	0.73
	RSU per grazed area (RSU/ha)	0.92
Dairy	Total RSU (RSU)	6,207
	RSU per farm area (RSU/ha)	18.25
	RSU per grazed area (RSU/ha)	23.13
Sheep	Total RSU (RSU)	859
	RSU per farm area (RSU/ha)	2.53
	RSU per grazed area (RSU/ha)	3.2

## ENTERPRISE RSU BY MONTH

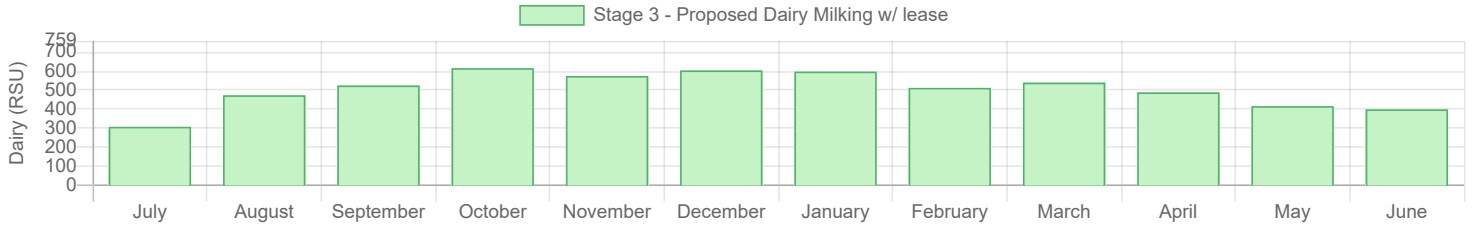
### ALL ENTERPRISES (RSU)



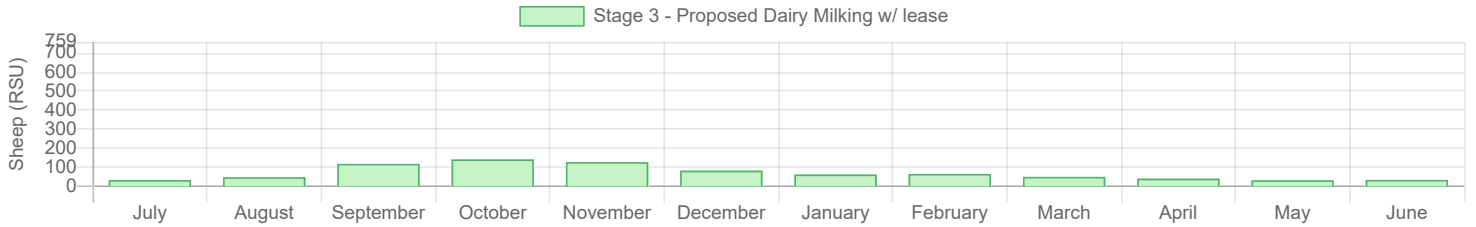
## DAIRY GRAZING (RSU)



## DAIRY (RSU)

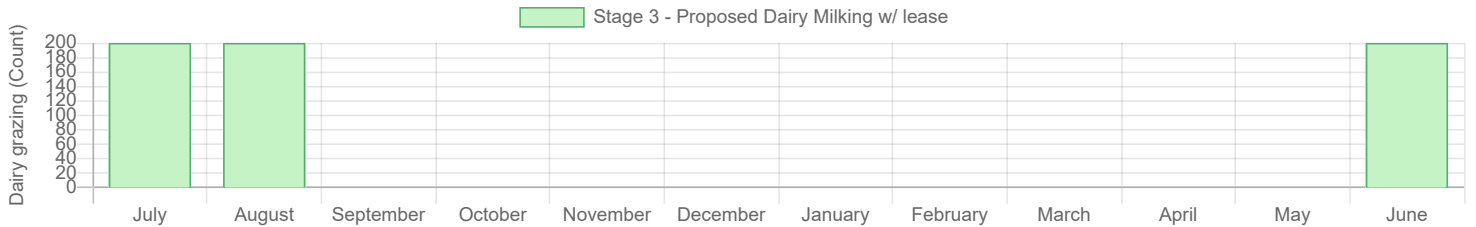


## SHEEP (RSU)

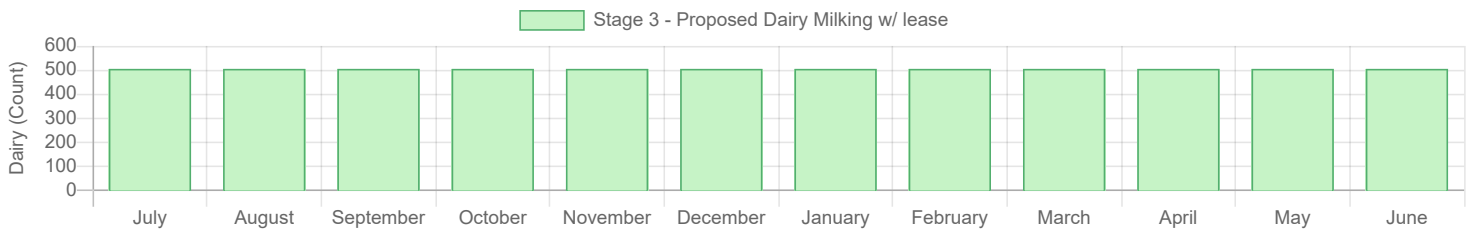


## ENTERPRISE STOCK NUMBERS BY MONTH

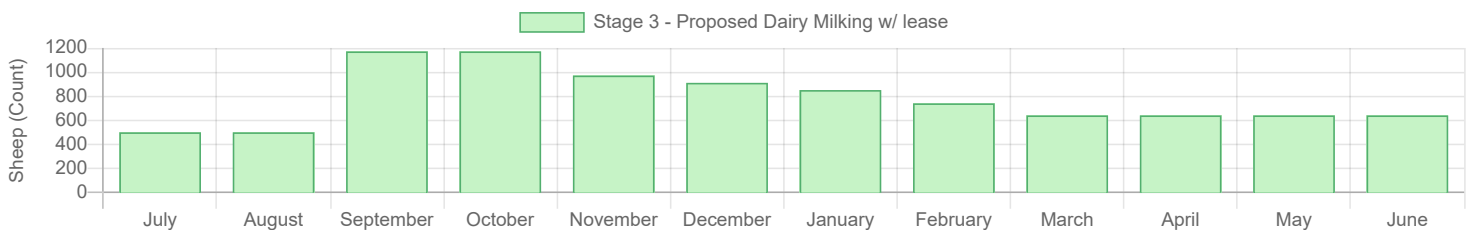
### DAIRY GRAZING (COUNT)



### DAIRY (COUNT)



### SHEEP (COUNT)

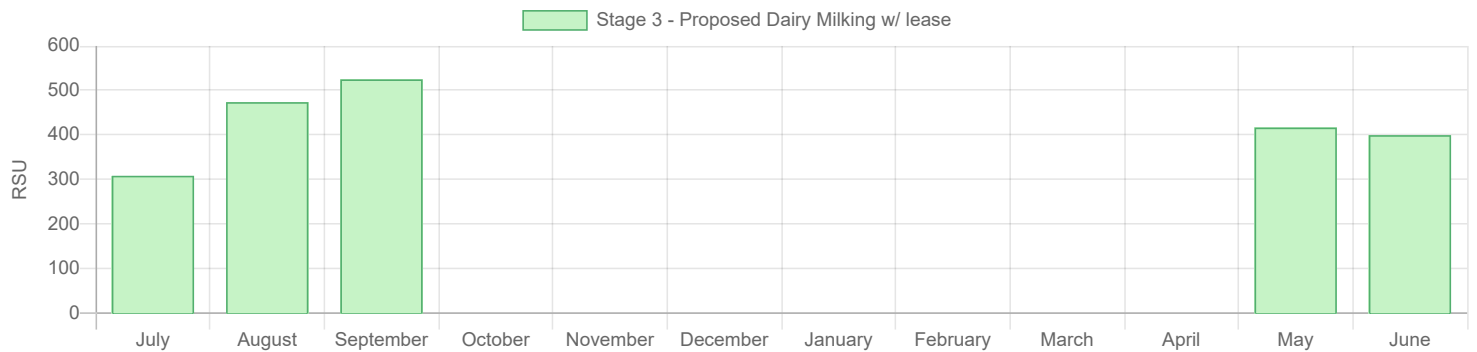


## STRUCTURES

		STAGE 3 - PROPOSED DAIRY MILKING W/
Covered wintering pad/shelter - Dairy	RSU on structure (RSU)	2,125

## STRUCTURE RSU BY MONTH

### COVERED WINTERING PAD/SHELTER - DAIRY

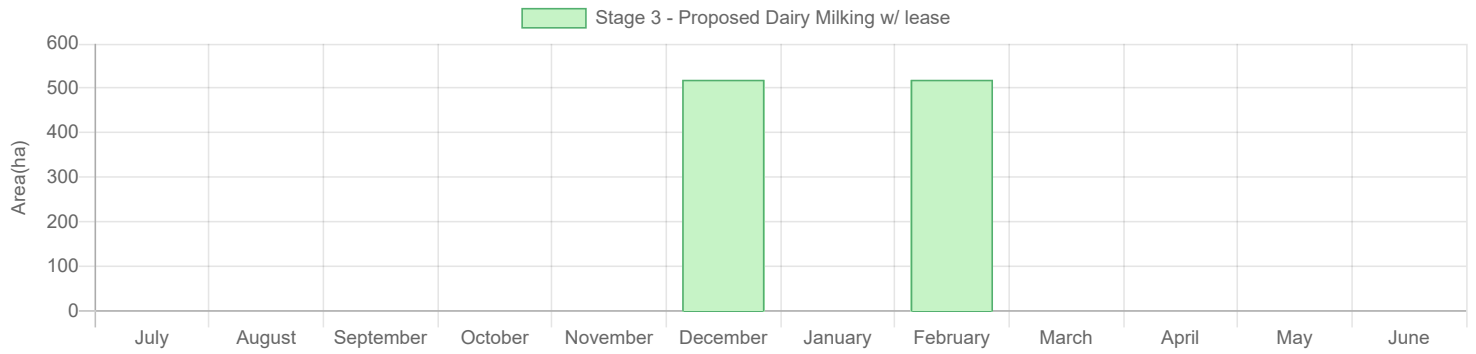


## EFFLUENT

		STAGE 3 - PROPOSED DAIRY MILKING W/
Area receiving liquid	Total area (ha)	297
	Pastoral area receiving liquid (ha)	252
	% of farm pastoral area (%)	97
	Average liquid effluent (N/ha/yr)	49
Average fertiliser (N/ha/yr)	Average fertiliser (N/ha/yr)	100
	Average other (N/ha/yr)	22
	Source of N in effluent blocks	
	Effluent from farm dairy (%)	27
	Effluent from Uncovered wintering pad/shelter (%)	49
	Solids (%)	24
Area of farm to apply all effluent to achieve rates of	150 kg N/ha/yr - Liquid (ha)	103
	150 kg N/ha/yr - Solid (ha)	37
	150 kg N/ha/yr - Total (ha)	140
	Maintenance K (ha)	901
	100 kg K/ha/yr (ha)	270

## EFFLUENT SOLIDS BY MONTH

### SOLIDS APPLICATION AREA BY MONTH



## FEED

		STAGE 3 - PROPOSED DAIRY MILKING W/
RSU	Total (RSU)	7,163
	Pasture (RSU)	3,954
	Farm supplements (RSU)	887
	Imported other supplements (RSU)	1,538
	Imported fodder supplements (RSU)	673
	Crops (RSU)	111

## RSU - DAIRY GRAZING

		STAGE 3 - PROPOSED DAIRY MILKING W/
	Total (RSU)	247
	Pasture (RSU)	247

## RSU - DAIRY

		STAGE 3 - PROPOSED DAIRY MILKING W/
	Total (RSU)	6,060
	Pasture (RSU)	2,962
	Farm supplements (RSU)	887
	Imported other supplements (RSU)	1,538
	Imported fodder supplements (RSU)	673

## RSU - SHEEP

		STAGE 3 - PROPOSED DAIRY MILKING W/
	Total (RSU)	856
	Pasture (RSU)	745
	Crops (RSU)	111

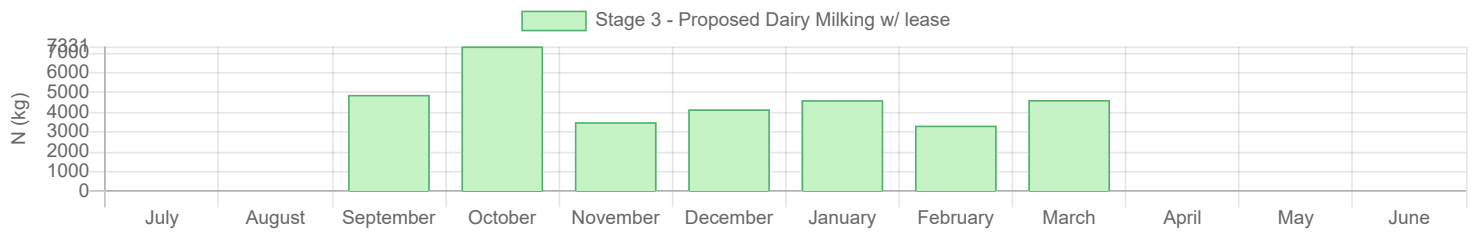


# FERTILISER

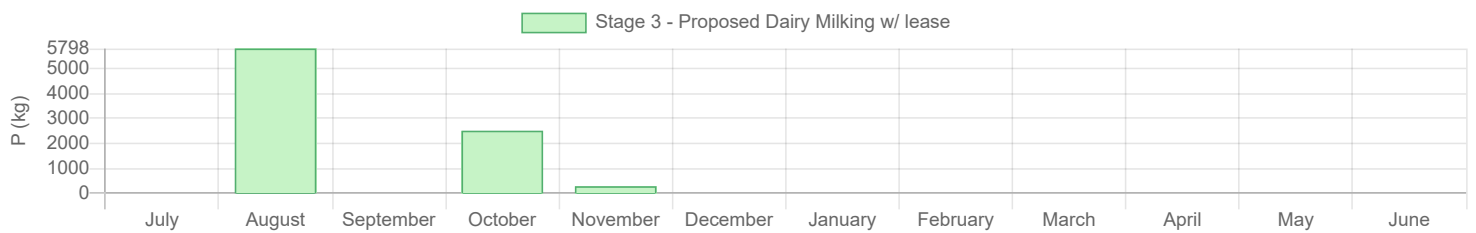
		STAGE 3 - PROPOSED DAIRY MILKING W/
Synthetic N	Crop (kg)	5,310
	Crop (kg/ha)	118
Synthetic N	Fodder crop (kg)	1,360
	Fodder crop (kg/ha)	170
Synthetic N	Pasture (kg)	25,820.1
	Pasture (kg/ha)	99
Synthetic P	Crop (kg)	1,350
	Crop (kg/ha)	30
Synthetic P	Fodder crop (kg)	288
	Fodder crop (kg/ha)	36
Synthetic P	Pasture (kg)	6,926.8
	Pasture (kg/ha)	27

## FERTILISER NUTRIENTS BY MONTH

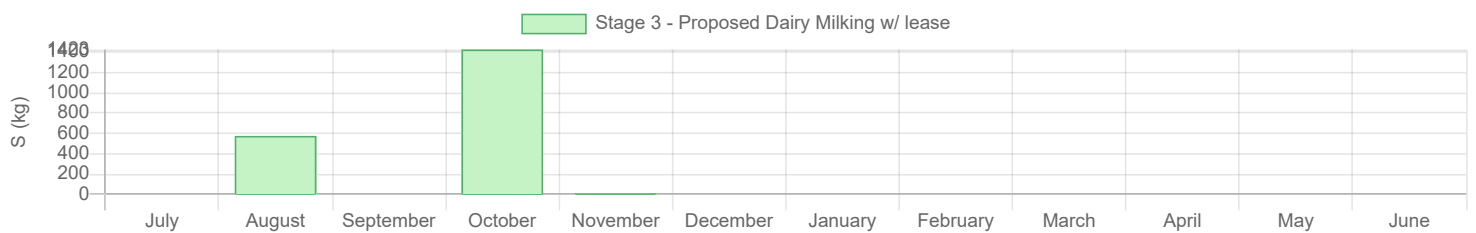
### N (KG)



### P (KG)



### S (KG)



! The selected analysis does not contain irrigation information

# OVERSEER

## FARM SUMMARY REPORT

Printed date: 22 Mar 2022, 3:34PM

Printed by: Lowe Environmental Impact



31857

135 Capil Rd, Grove Bush 9872, New Zealand

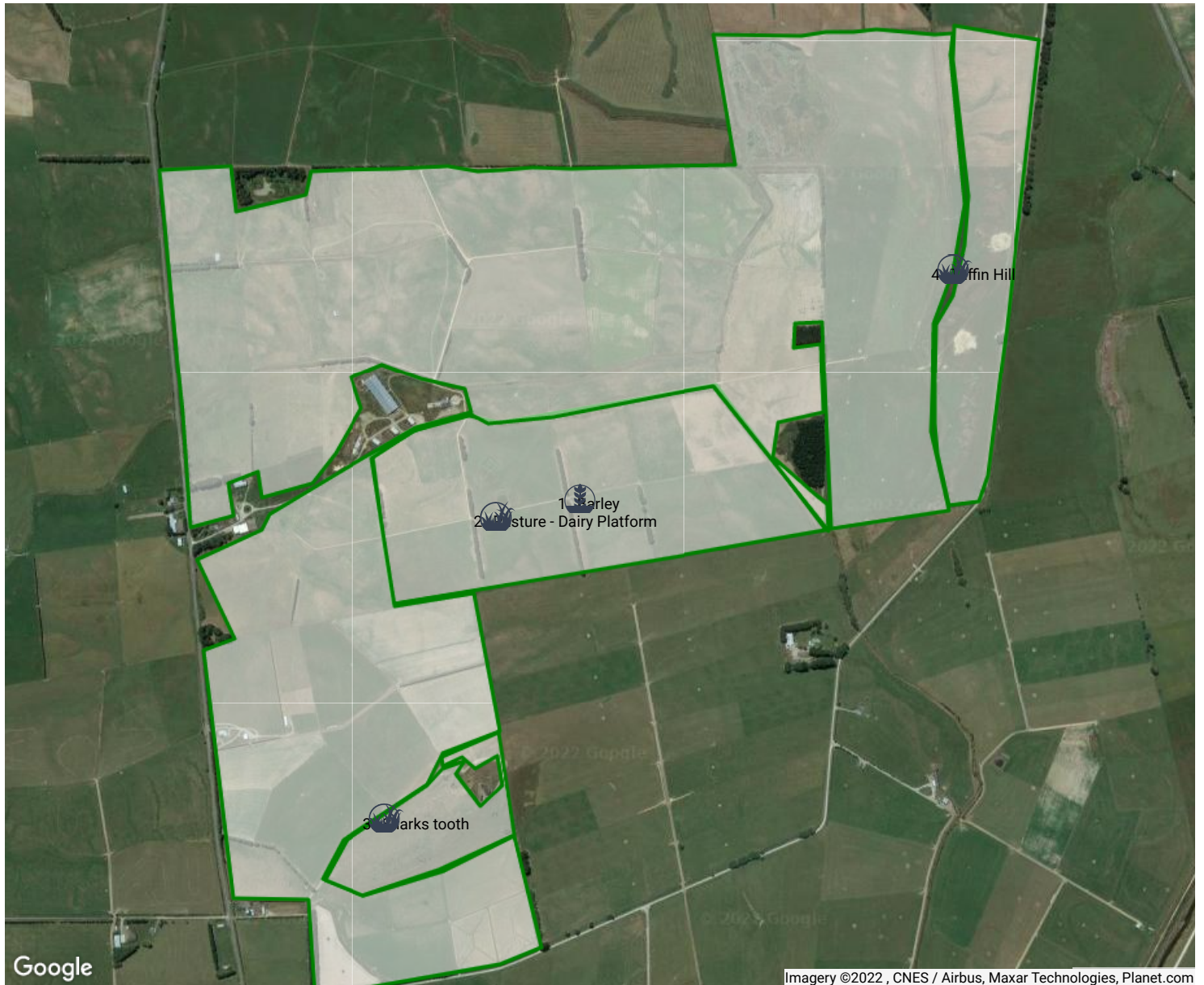
Stage 4 - Proposed Dairy Milking w/o lease

Analysis type	Scenario
Model version	6.4.2

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# FARM MAP



## GREENHOUSE GAS EMISSIONS

	STAGE 4 - PROPOSED DAIRY MILKING W
Total GHG emissions (eCO2/tonnes/yr)	5,961.2
Methane (eCO2/tonnes/yr)	4,545.8
N2O (eCO2/tonnes/yr)	533.8
CO2 (eCO2/tonnes/yr)	881.6

## eCO2 FOOTPRINT

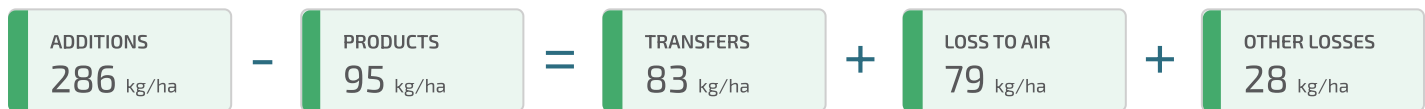
	STAGE 4 - PROPOSED DAIRY MILKING W
Dairy (kg/cow)	9,138
Dairy grazing (kg/SU)	406
Vegetable/arable crops (kg/ha)	761

## NUTRIENTS

		STAGE 4 - PROPOSED DAIRY MILKING W
Nitrogen	Total loss (kg)	9,620
	Loss/ha (kg/ha)	28
	NCE (%)	31
	N Surplus (kg/ha)	197
Phosphorus	Total loss (kg)	648
	Loss/ha (kg/ha)	1.9
	P Surplus (kg/ha)	28

## NITROGEN

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the N surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Nitrogen surplus is total additions minus product removed (191 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

## NITROGEN BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		STAGE 4 - PROPOSED DAIRY MILKING W
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.'	80
Rain/clover fixation	Nutrients from rainfall and fixation of atmospheric nitrogen by legumes/clover.	87
Supplements	Nutrients from supplements imported onto the farm.	119
<b>Total</b>		<b>286</b>

## NITROGEN REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		STAGE 4 - PROPOSED DAIRY MILKING W
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	89
As supplements and crop residues	Nutrients removed in supplements and crop residue exported off farm.	6
<b>Total</b>		<b>95</b>

## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

		STAGE 4 - PROPOSED DAIRY MILKING W
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	61
Inorganic soil pool	Change in plant available nutrients based on soil tests.	36
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	12
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-26
Total		83

## NITROGEN LOST TO THE ATMOSPHERE

The nutrients lost into the atmosphere through volatilisation and denitrification.

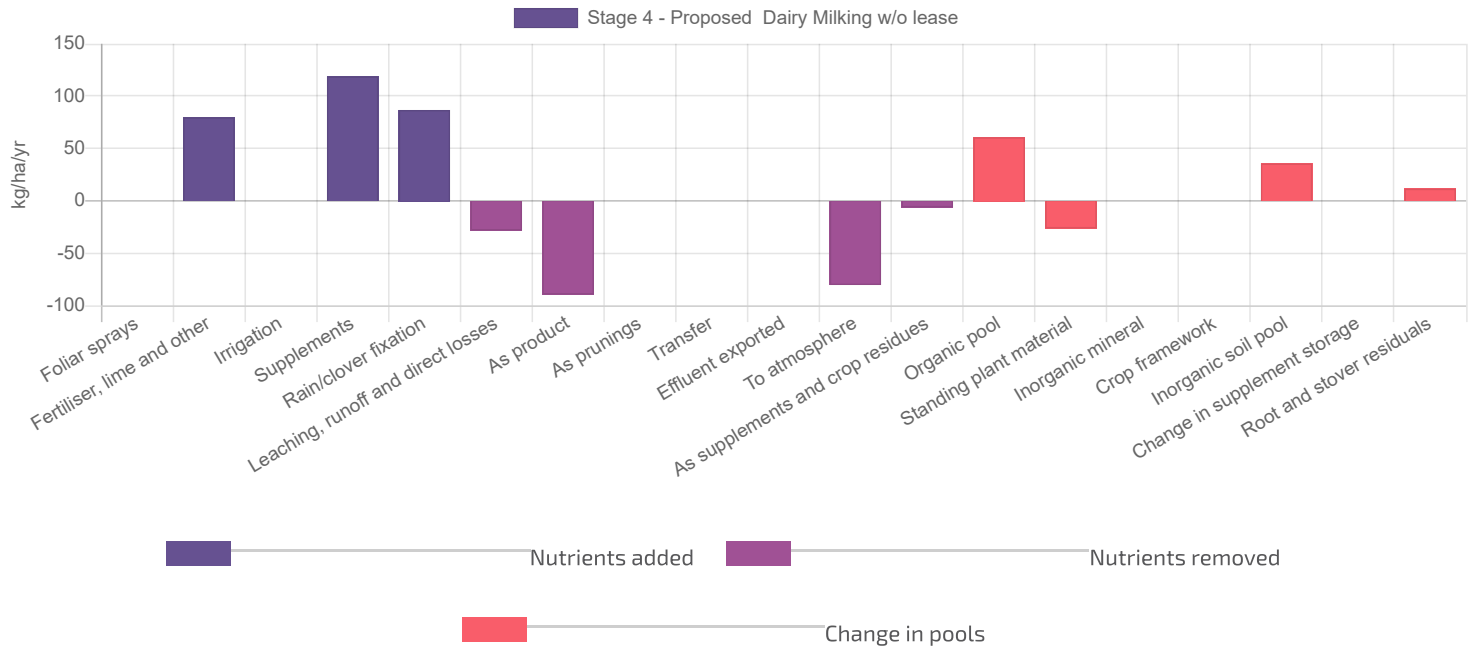
		STAGE 4 - PROPOSED DAIRY MILKING W
Denitrification - background	Background conversion of nitrate to nitrogen gas.	9
Volatilisation - other	Background loss of nitrogen to the atmosphere as ammonia.	33
Volatilisation - urine	Loss of nitrogen in urine to the atmosphere as ammonia.	26
Denitrification - urine	Conversion of nitrate from urine to nitrogen gas.	9
Volatilisation - fertiliser	Loss of nitrogen in fertiliser to the atmosphere as ammonia.	2
Total		79

## OTHER NITROGEN LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

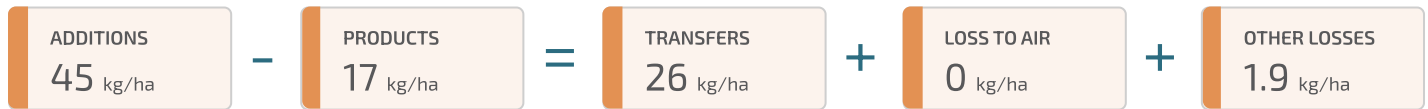
		STAGE 4 - PROPOSED DAIRY MILKING W
Leaching - urine patches	Nutrients from urine that has leached below the root zone.	6
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	19
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	3
Total		28

## NITROGEN MOVEMENTS



## PHOSPHORUS

Nutrients are brought to the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the P surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Phosphorus surplus is total additions minus product removed (28 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

## PHOSPHORUS BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		STAGE 4 - PROPOSED DAIRY MILKING W
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.	25
Supplements	Nutrients from supplements imported onto the farm.	20
<b>Total</b>		<b>45</b>

## PHOSPHORUS REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		STAGE 4 - PROPOSED DAIRY MILKING W
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	17
<b>Total</b>		<b>17</b>

## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

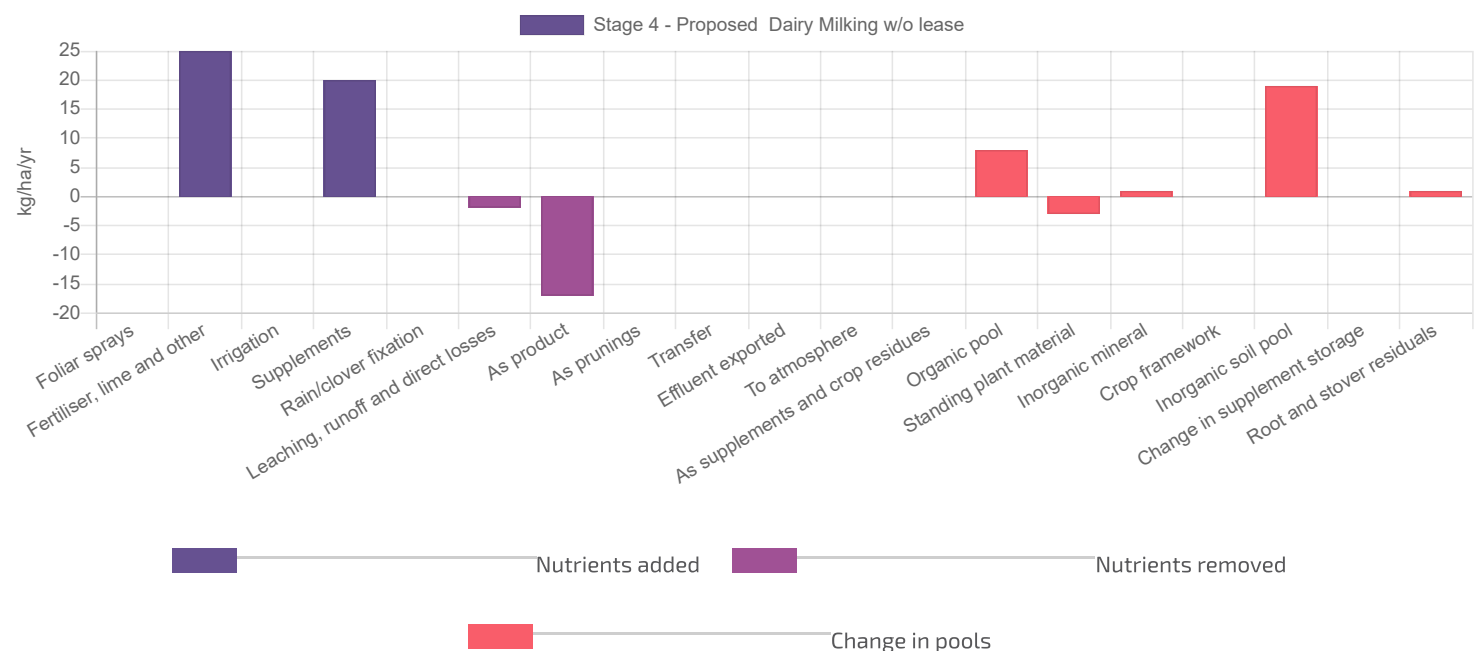
		STAGE 4 - PROPOSED DAIRY MILKING W
Inorganic mineral	Nutrients adsorbed on (adhered to) clay minerals and undissolved lime.	1
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	8
Inorganic soil pool	Change in plant available nutrients based on soil tests.	19
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	1
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-3
<b>Total</b>		<b>26</b>

## OTHER PHOSPHORUS LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

		STAGE 4 - PROPOSED DAIRY MILKING W
Runoff	Nutrients lost during runoff (over land).	1.3
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	0.3
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	0.3
<b>Total</b>		<b>1.9</b>

## PHOSPHORUS MOVEMENTS



## PHYSICAL CHARACTERISTICS

		STAGE 4 - PROPOSED DAIRY MILKING W
<b>Land area</b>	Farm area (ha)	340.1
	Productive block area (ha)	313.4
<b>Climate</b>	Average temperature (°C)	10.3
	Average rainfall (mm)	1,110
	Average PET (mm)	718

## FARM SOILS

		STAGE 4 - PROPOSED DAIRY MILKING W
<b>Recent/YGE/BGE/Pallic Pukem_6a.1</b>	Area (ha)	184.9
	Properties modified	-
<b>Sedimentary/Gley Makar_3b.1</b>	Area (ha)	88.5
	Properties modified	-
<b>Sedimentary/Melanic Kau_7a.1</b>	Area (ha)	8.7
	Properties modified	-
<b>Sedimentary/Melanic Tamar_3a.1</b>	Area (ha)	31.3
	Properties modified	-

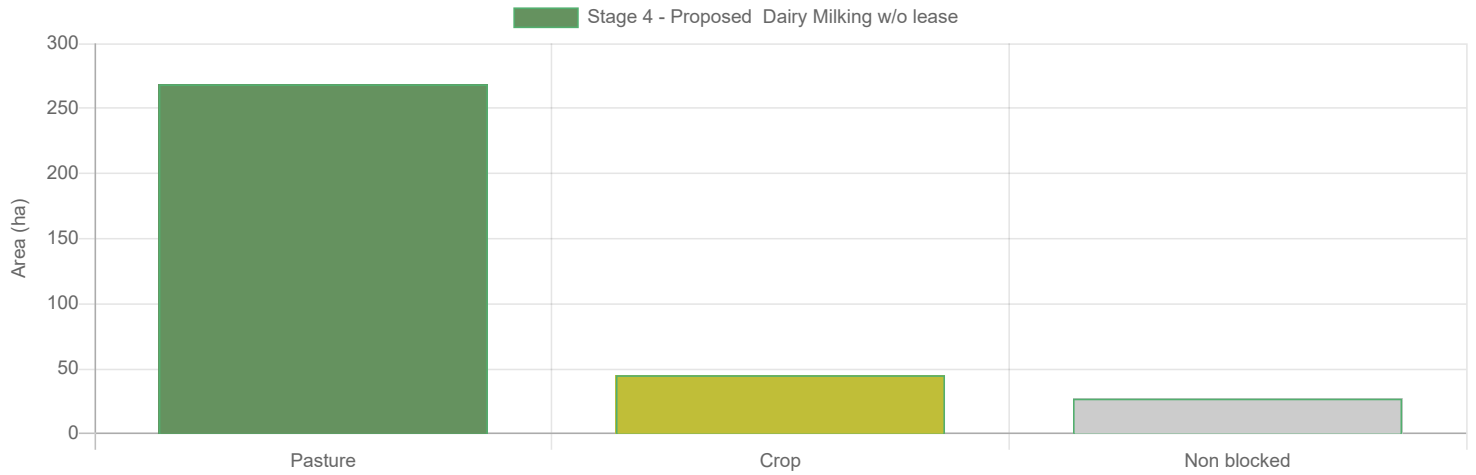
1 - Olsen P is calculated using soil test results, proportioned by the area of the farm that this soil covers.



## BLOCK TYPES

		STAGE 4 - PROPOSED DAIRY MILKING W
<b>Pasture</b>	Area (ha)	268
	Pasture grown (T/DM/Yr)	3,296
	Pasture intake (T/DM/Yr)	2,067
	Supplements harvested (T/DM/Yr)	850
<b>Crop</b>	Area (ha)	45
	Pasture grown (T/DM/Yr)	156
	Pasture intake (T/DM/Yr)	133
<b>Non blocked</b>	Area (ha)	27
<b>Total area</b>	(ha)	340

## EFFECTIVE AREA BY BLOCK TYPE



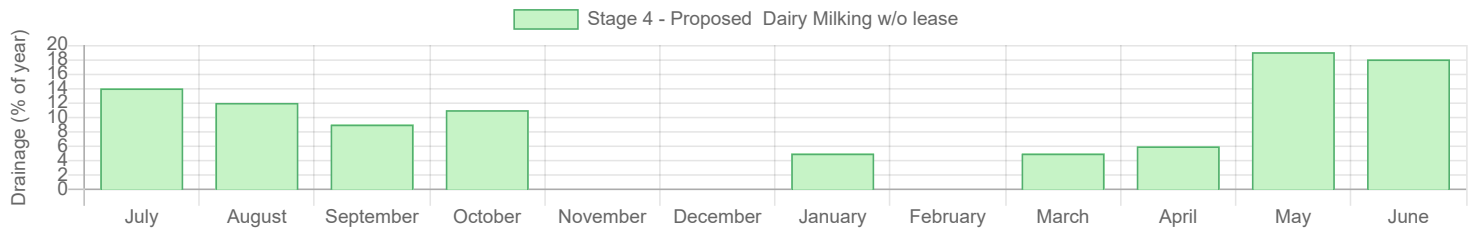
## DRAINAGE

- Drainage indicates the amount of water draining below the root zone of typical crops or pastures (60cm). Drainage occurs when the amount of water (from rainfall and irrigation) exceeds the water holding capacity of the soil. When water drains it can take any excess nitrogen below this root zone and so risks leaching from the farm into the water table below.

The model uses a 30 year average climate for each block's location. The following graph shows the percentage of annual drainage that occurs each month using this average climate. This provides an indication of when the highest leaching risk is for the farm when under average conditions.

		STAGE 4 - PROPOSED DAIRY MILKING W
Drainage	Average drainage at 60cm (mm)	-
	Nitrogen concentration in water drained (ppm)	-

### WHEN DRAINAGE AT 60CM OCCURS



## WETLANDS & ARTIFICIAL DRAINAGE SYSTEMS

		STAGE 4 - PROPOSED DAIRY MILKING W
Mole tile drainage	Area (ha)	268.7

## CROPS

		STAGE 4 - PROPOSED DAIRY MILKING W
Ryegrass/white clover	Area (ha)	268.4
	Pasture grown (T/DM/Yr)	3,296
	Pasture intake (T/DM/Yr)	2,067
	Supplements (T/DM/Yr)	850
Barley (spring)	Area (ha)	45
	Yield (T grain)	360

## ANIMALS

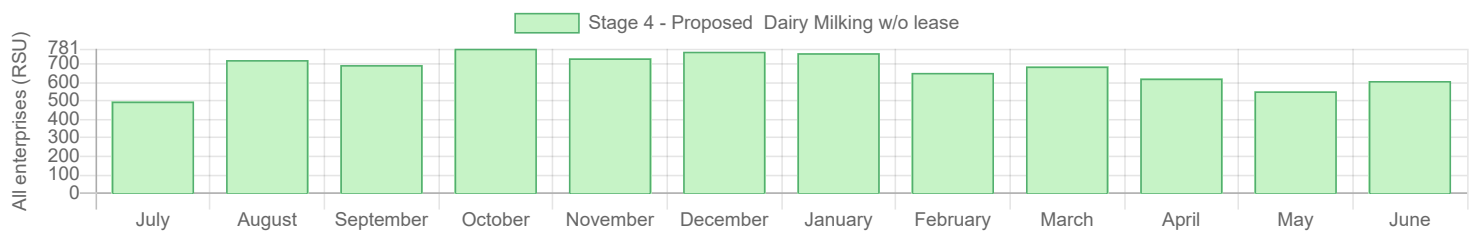
		STAGE 4 - PROPOSED DAIRY MILKING W
RSU	Total RSU (RSU)	8,131
	RSU per farm area (RSU)	23.91
	RSU per productive area (RSU)	25.94
Production	Total liveweight brought (kg/ha grazed)	1,035
	Total liveweight reared (kg/ha grazed)	59
	Total liveweight sold (kg/ha grazed)	1,070
	Milk production per cow (kg milk solids / cow)	550
	Milk solids (kg/ha grazed)	1,311
	Milking herd size (peak cows/ha grazed)	2.4

## ENTERPRISE RSU

		STAGE 4 - PROPOSED DAIRY MILKING W
Dairy grazing	Total RSU (RSU)	261
	RSU per farm area (RSU/ha)	0.77
	RSU per grazed area (RSU/ha)	0.97
Dairy	Total RSU (RSU)	7,870
	RSU per farm area (RSU/ha)	23.14
	RSU per grazed area (RSU/ha)	29.32

## ENTERPRISE RSU BY MONTH

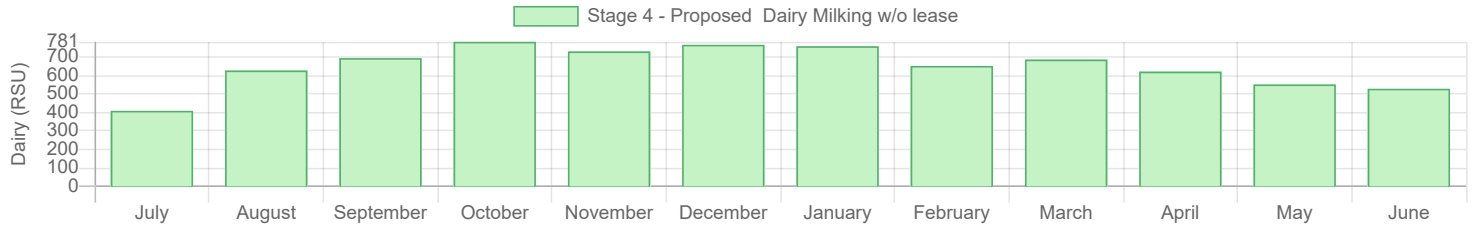
### ALL ENTERPRISES (RSU)



### DAIRY GRAZING (RSU)

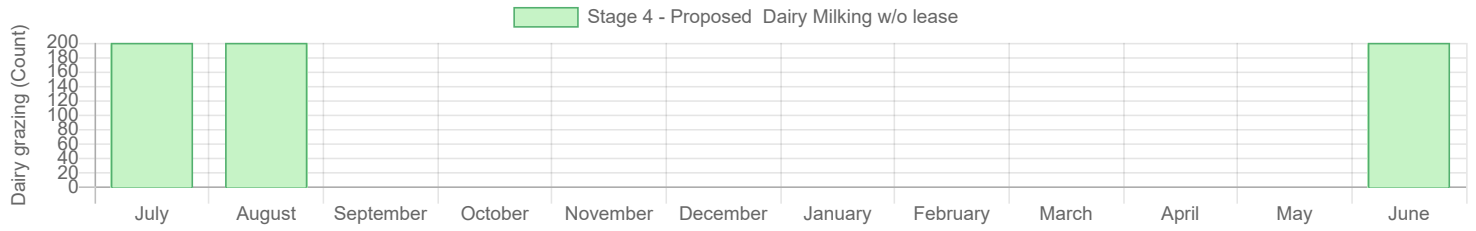


## DAIRY (RSU)

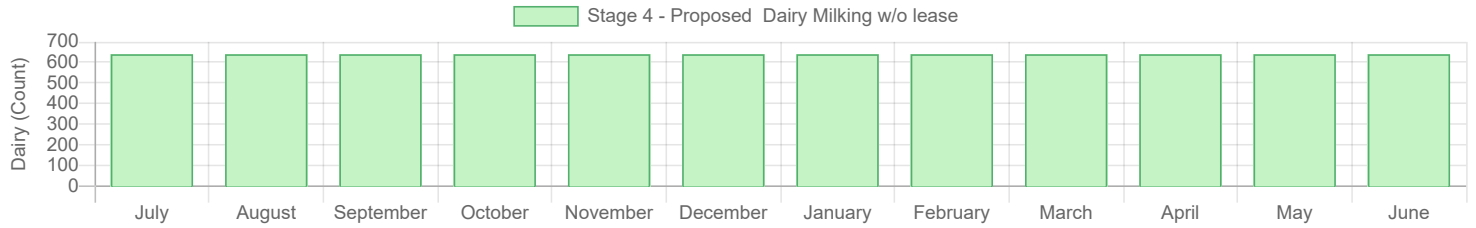


## ENTERPRISE STOCK NUMBERS BY MONTH

### DAIRY GRAZING (COUNT)



### DAIRY (COUNT)

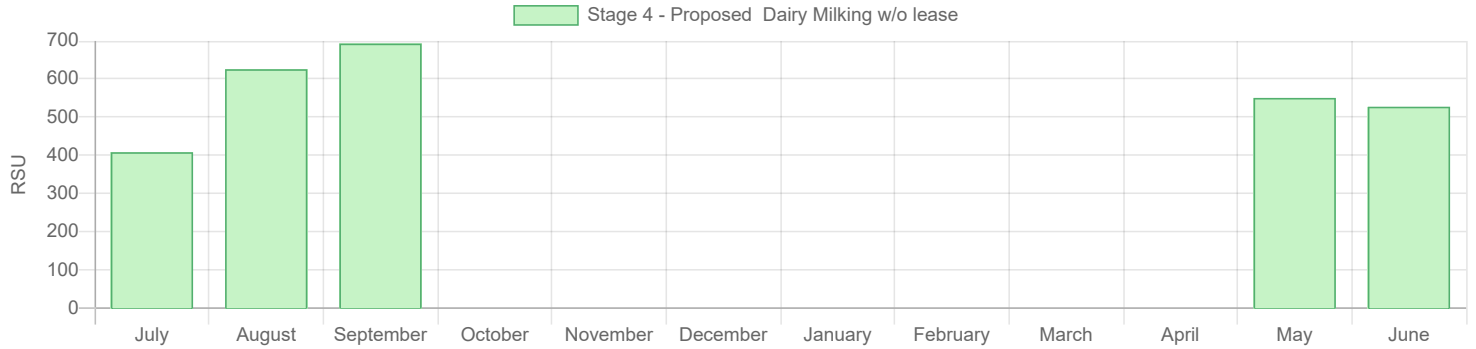


## STRUCTURES

		STAGE 4 - PROPOSED DAIRY MILKING W
Covered wintering pad/shelter - Dairy	RSU on structure (RSU)	2,807

## STRUCTURE RSU BY MONTH

### COVERED WINTERING PAD/SHELTER - DAIRY

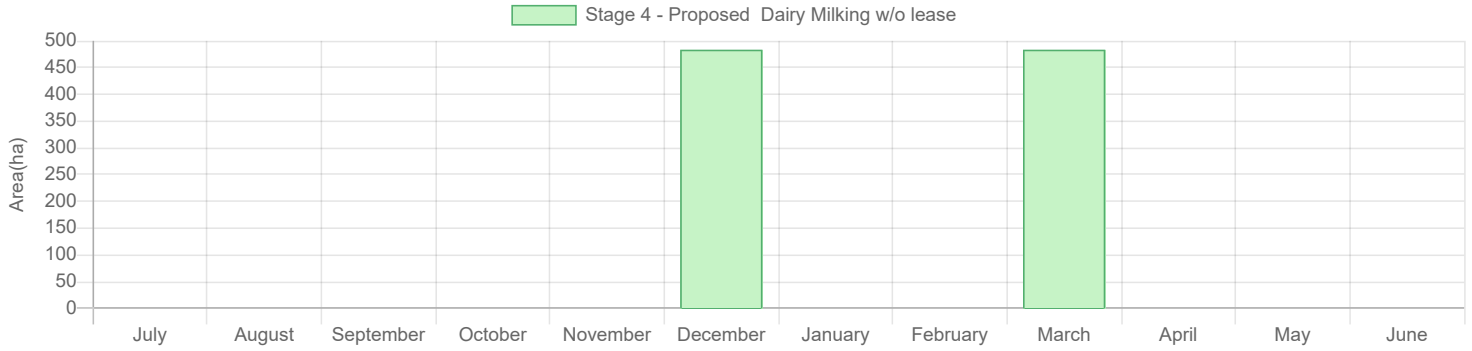


## EFFLUENT

		STAGE 4 - PROPOSED DAIRY MILKING W
Area receiving liquid	Total area (ha)	305
	Pastoral area receiving liquid (ha)	260
	% of farm pastoral area (%)	97
	Average liquid effluent (N/ha/yr)	65
Area of farm to apply all effluent to achieve rates of	Average fertiliser (N/ha/yr)	83
	Average other (N/ha/yr)	29
	Source of N in effluent blocks	
	Effluent from farm dairy (%)	26
	Effluent from Uncovered wintering pad/shelter (%)	50
	Solids (%)	24
Area of farm to apply all effluent to achieve rates of	150 kg N/ha/yr - Liquid (ha)	139
	150 kg N/ha/yr - Solid (ha)	49
	150 kg N/ha/yr - Total (ha)	189
	Maintenance K (ha)	1,103
	100 kg K/ha/yr (ha)	363

# EFFLUENT SOLIDS BY MONTH

## SOLIDS APPLICATION AREA BY MONTH



## FEED

		STAGE 4 - PROPOSED DAIRY MILKING W
RSU	Total (RSU)	8,055
	Pasture (RSU)	3,955
	Farm supplements (RSU)	1,160
	Imported other supplements (RSU)	2,050
	Imported fodder supplements (RSU)	890

## RSU - DAIRY GRAZING

		STAGE 4 - PROPOSED DAIRY MILKING W
	Total (RSU)	260
	Pasture (RSU)	260

## RSU - DAIRY

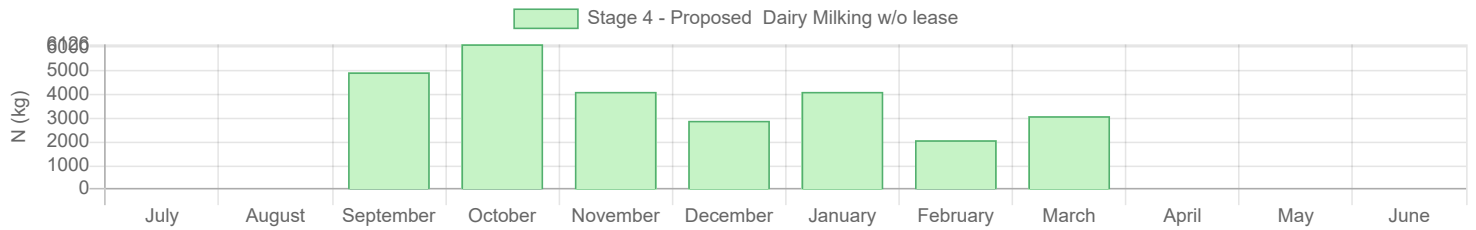
		STAGE 4 - PROPOSED DAIRY MILKING W
	Total (RSU)	7,795
	Pasture (RSU)	3,695
	Farm supplements (RSU)	1,160
	Imported other supplements (RSU)	2,050
	Imported fodder supplements (RSU)	890

# FERTILISER

		STAGE 4 - PROPOSED DAIRY MILKING W
Synthetic N	Crop (kg)	5,310
	Crop (kg/ha)	118
Synthetic N	Pasture (kg)	21,920.4
	Pasture (kg/ha)	82
Synthetic P	Crop (kg)	1,350
	Crop (kg/ha)	30
Synthetic P	Pasture (kg)	6,978.4
	Pasture (kg/ha)	26

## FERTILISER NUTRIENTS BY MONTH

### N (KG)



### P (KG)



### S (KG)



! The selected analysis does not contain irrigation information

# 444 Springhills -Tussock Creek Road – Farm 444

## Consent Application and Assessment of Environmental Effects

Prepared for

**Capil Grove Limited**

Prepared by

**L E W E**  
Environmental  
I m p a c t

April 2022







## 444 Springhills -Tussock Creek Road – Farm 444

# Consent Application and Assessment of Environmental Effects

## Capil Grove Limited

This report has been prepared for the **Capil Grove Limited** by Low Environmental Impact (LEI). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other parties.

Quality Assurance Statement		
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Status:	Final	

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Ref: RE-10740\_Conversion\_444\_AEE\_220405\_Final.docx

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## 1 EXECUTIVE SUMMARY

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This application is for the establishment of a dairy cow milking operation on what has been five different properties that have previously been used for sheep farming (including more recently sheep milking), dairy support (dairy replacement and cow grazing) and beef farming.

The overall goal of the Applicant is to create a year round high productivity milking operation with cows that would otherwise be culled, while improving their overall environmental performance. The main farm currently has consent for dairy support grazing, including the use of a wintering barn.

### 1.1 Previous Farming System

The Lindsay family (Capil Grove Limited) have recently purchased two properties. These include:

- Harwood: Located at 346 Springhills-Tussock Creek Road, Springhills, Southland. This farm was operated as a sheep block with 200 ewes and 200 lambs.
- Hancox: Located at 394 Springhills-Tussock Creek Road, Springhills, Southland. This property operates as a dairy support grazing 400 winter cows on kale and grazing calves on pasture until the second winter.

The applicant also owns three other properties within the surrounding area. These include:

- 444 Farm: Located at 444 Springhills-Tussock Creek Road, Springhills, Southland. The farm has previously been operated as a high intensity sheep block, grazing up to 3,000 breeding ewes, rams, the associated lambs and holding up to 750 hoggets throughout the year. Sheep milking has also previously been carried out on the farm in the past. As noted below, consent has been granted for this property to be used for dairy support;
- Tuffin Block: Located at the east of 444 Farm on Sharks Tooth Road. The Tuffin Block farmed 430 cattle in an intensive grazing system, with swedes provided as a wintering crop; and
- Sharks Tooth Block: Located to the south east of the property on Sharks Tooth Road farmed as part of Tuffin Block.

The total area of the combined blocks is 340.1 ha (313.4 ha effective). The applicant wishes to combine all these farms under one dairy operation. The nutrient (nitrogen and phosphorus) losses from all the combined farming blocks from the previous systems in 2020 as modelled by OverseerFM is 34 kg N/ha/yr and 1.9 kg P/ha/yr.

### 1.2 Proposed Farming System

Capil Grove Limited (CGL) has recently been granted consent to use the 444 Farm for dairy support – being grazing and barn housing of up to 456 cattle. However, as a result of recent sales and purchase opportunities which have arisen, CGL wish to convert this farm to a dairy milking platform rather than dairy support. This conversion from the original sheep milking/ dairy support operation, in combination with the other purchased properties, provides the potential to increase production while also mitigating the negative impact on the environment from the original farming operations. CGL proposes to milk throughout the whole year, utilising cows that would otherwise be culled. The use of wintering barns to feed silage over winter and an extensive variety of best management practices will ensure these cows are high producing with low environmental impact.

The proposed dairy milking system would run 640 cows over a total of 340 ha (313 ha which will be effective). In the winter, the wintering barns will continue to be operated at best practice,



housing cows when weather conditions are poor and the risk of environmental runoff and pugging are higher. The current barn has the capacity to hold 456 cows, therefore the Applicant proposes to construct a new wintering barn to allow all cows to be housed, including some cows from their other property; Capil Road. This is to stop damage to soil structure over winter and during adverse weather conditions. The current wintering barn consent will require variation for this proposal.

Due to the increase in land and cow numbers, an existing groundwater take is part of this application to supply stock drinking water and cowshed washdown. The water would be sourced from a spring located on the recently purchased Harwood Block. The proposed rate would be a maximum of 2 L/s and a peak volume of 85,800 litres/ day. This peak volume would be during winter for drinking water when the Capil Grove Farm cows would be housed in the barn (note not peaking in summer).

A new pond consent was also granted in June 2021 to store an extra 5,000 m<sup>3</sup> of effluent from the wintering barn, however CGL wish to vary this consent to construct a 17,800 m<sup>3</sup> pond. This not only provides effluent to be captured with nutrients managed and applied to land when soil and climate conditions are appropriate, but also allows for the storage over all winter months and avoids applying effluent in times when it is cold and the soils are saturated.

As a further mitigation strategy, barley grain will be grown for supplements used over spring and through to March. The grain will be harvested and fed back to stock in the milking shed. This allows CGL to reduce the negative impact on the environment by not having to import grain on to the property, but also have the barley utilise extra phosphorus reserves from the soil that could otherwise runoff from the system in early autumn. Extra supplements such as palm kernel and molasses will also be used for supplements in the milking shed. The proposed operation would be run with a modelled nitrogen nutrient loss that is lower than the combined previous operations.

The potential environmental effects of the proposal have been assessed on the receiving environment. There will be exclusion margins between the effluent application site, any waterways and the property boundaries involved, so the off-site effects are expected to be negligible. The 444 Farm has a farm and conversion environmental plan and an effluent management plan which outlines the mitigations that take place to ensure that the risks to the environment are minimised.

The effects of the proposed activity are deemed to be less than minor based on the modelled reduction in the nitrogen lost from the farm. Further, the proposal may on the whole be beneficial to the environment when compared to the existing operations.



#### Original 444 Farm - 177 ha

- Already owned
- High intensity sheep grazing and sheep milking block
- Upto 4,400 Breeding ewes

#### Tuffin Farm - 112 ha

- Already owned
- High intensity dairy support and beef operation
- 430 cattle (400 dairy replacements and 30 beef cattle)
- Winter swede crop

#### Sharks Tooth Block - 9 ha

- Recently purchased
- High intensity dairy grazing and beef operation
- 400 dairy cows winter grazing on kale
- 69 calves reared to R1 yearlings.

#### Hancox Farm - 37 ha

- Recently purchased
- High intensity dairy grazing and beef operation
- 400 dairy cows winter grazing on kale
- 69 calves reared to R1 yearlings.

#### Harwood - 15 ha

- Recently purchased
- Sheep operation
- 200 ewes and 200 lambs

#### New Proposed 444 Farm - 341 ha

- The original 444 farm, Tuffin, Shark's Tooth, Hancox and Harwood Farms combined.
- Milking up to 640 cows over four stages
- New 17,800 m<sup>3</sup> pond
- New 4,320 m<sup>2</sup> wintering barn
- New groundwater take at a rate of 2L/s and upto 85,800 L/day
- Cows housed in barn over winter (including Housing upto 200 cows from Capil Road in the barn over winter)
- No intensive winter grazing
- Nitrogen losses = 28 kg N/ha/yr vs 34 kg N/ha/yr for the previous farms operations combined

The proposal has been assessed against the objectives, policies and rules of the relevant national and regional plans and policy statements. The various activities and their relevant rules are shown in the table below.



**Table 1.1: Activity status and applicable rules.**

<b>Consent</b>	<b>Plan</b>	<b>Rule</b>	<b>Activity Status</b>
Discharge Permit to discharge agricultural effluent to land	RWPS	50 (d)	Discretionary
	PSWLP	35 (c)	Discretionary
	RELAP	5.4.6	Discretionary
Permit for Farming	PSWLP	20e	Discretionary
Water Permit to take and use groundwater for dairy shed wash down and stock drinking	RWPS	23 (d)ii	Discretionary
Variation for the use of land for the maintenance and use of agricultural effluent storage facilities	PSWLP	32B	Controlled
Conversion to dairy	RWPS	17 (a)	Discretionary
	NES-F 2020	19	Discretionary
Variation for the use of the wintering barns for upto 956 cows.	PSWLP	35A	Discretionary
	NES-F 2020	10	Discretionary

Overall, the activity and its proposed variations has been assessed as a **Discretionary Activity**

The potential adverse effects of the proposed activities are considered to be less than minor. The proposed activities are not contrary to any of the objectives and policies of the relevant matters set out in Section 104 of the RMA, including the relevant regional plans for the Southland Region. Given the assessment of effects on the environment, it is considered that it is appropriate to grant on a **non-notified basis** resource consents sought by Capil Grove Limited.





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## 2 INTRODUCTION

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### 2.1 Purpose

CGL have recently purchased two properties; one at 346 Springhills-Tussock Creek Road, and another at 394 Springhills-Tussock Creek Road, Springhills, Southland. These farms were run as a high intensity dairy support grazing, beef and sheep operation. The Applicant also owns three other farms in the area; Tuffin Farm previously run as a high intensity dairy replacement and beef operation. Shark's Tooth Block which was run as part of Tuffin Farm and 444 Farm which was a high intensity sheep operation with consent to be run as a dairy support operation. This application is for consent to convert all properties into one dairy farming operation.

Initially it was proposed to use 444 Farm as a support block for the Lindsay's (farm owners) existing dairy farm that is nearby in the Grove Bush area. However, with the purchase of the adjacent properties dairy milking is now proposed by combining all the farms mentioned above as it gives the option to increase the production of the properties without having a negative impact on the environment.

The existing wintering barn would be used to minimise environmental impacts over the winter, which has a capacity to hold 456 cows. A new wintering barn is proposed so the rest of the cows can also be kept off the pasture during winter, including up to 200 cows from the Applicants other dairy property – Capil Grove Farm.

Due to the increase in land and cow numbers, a groundwater take is also proposed as part of this application to supply stock drinking water and cowshed washdown. The water would be sourced from a spring (considered groundwater under Appendix L of the Southland Regional Water Plan) located at NZTM 1250135E 4871243N on Sharks Tooth Block. The proposed rate would be a maximum of 2 L/s and a total peak volume of 85,800 litres/day.

There are existing storage ponds and a sludge bed on the farm to store effluent collected from the wintering barn, but these will be decommissioned following the installation of the new proposed pond.

This report provides a resource consent application and assessment of environmental effects to Environment Southland ("ES") to gain:

- Consent to convert land and use the farm for dairy cow milking;
- Variation to discharge permit AUTH-20211143-02 for the application of dairy effluent to the whole property (except Shark's Tooth Block);
- Variation to land use consent for the construction, maintenance and use of an effluent storage pond for the storage of agricultural effluent permit AUTH-20211143-03;
- Variation to land use consent AUTH-20211143-04 for the use of a wintering barn; and
- Consent for taking of groundwater.

Table 2.1 summarises the current consents granted, the changes required for this proposed application and the future consents required to farm under a dairy milking operation.



**Table 2.1: Current consents, changes required and future requirements to be farmed under a dairy milking operation.**

<b>Current</b>	<b>Changed Required</b>	<b>Future</b>
<b>Land use consent:</b> Use of land for dairy support use (AUTH-20211143-01).	Will be maintained to enable cows from the Capil grove property to be housed in the wintering barn.	<b>Land use consent:</b> Use of land for a 640 cow dairy milking operation plus the addition of 200 cows. (RWP Rule 17A)
<b>Discharge permit:</b> To discharge wintering barn effluent to land via low rate pod system and a slurry tanker (AUTH-20211143-02).	Variation to discharge wintering barn and dairy shed effluent to land over the whole farm (except Shark's Tooth Block) via low rate pod system and a slurry tanker.	<b>Discharge permit:</b> To discharge wintering barn and dairy shed effluent to land via low rate pod system and a slurry tanker.
<b>Land use consent:</b> To construct, maintain, and use a 5,000 m <sup>3</sup> effluent storage pond for the storage of agricultural effluent (AUTH-20211143-03).	Variation to increase pond size from 5,000 m <sup>3</sup> to 17,800 m <sup>3</sup> .	<b>Land use consent:</b> To construct, maintain, and use a 17,800 m <sup>3</sup> effluent storage pond for the storage of agricultural effluent.
<b>Land use consent:</b> Use of land for a wintering barn (AUTH-20211143-04).	Variation to allow for an extra wintering barn.	<b>Land use consent:</b> Use of land for two wintering barns to hold up to a combined number of 956 cows.
		<b>Groundwater Take:</b> Groundwater take for a peak use of 85,800 L/day at a rate of no more than 2L/s

## 2.2 The Applicant

### Applicant Address:

444 Farm  
 Capil Grove Limited  
 c/o N W and R J Lindsay  
 27 Capil Road  
 Grove Bush 9872

## 2.3 Scope

This report describes the receiving environment and the proposed activities. It assesses the available alternatives and the potential effects of the activities on the receiving environment. The report evaluates the potential effects against the provisions of the relevant statutory planning documents and includes a contingency plan to address possible difficulties that may arise in carrying out the planned activity. Mitigation and monitoring measures are described.

## 2.4 Farm Overview Summary

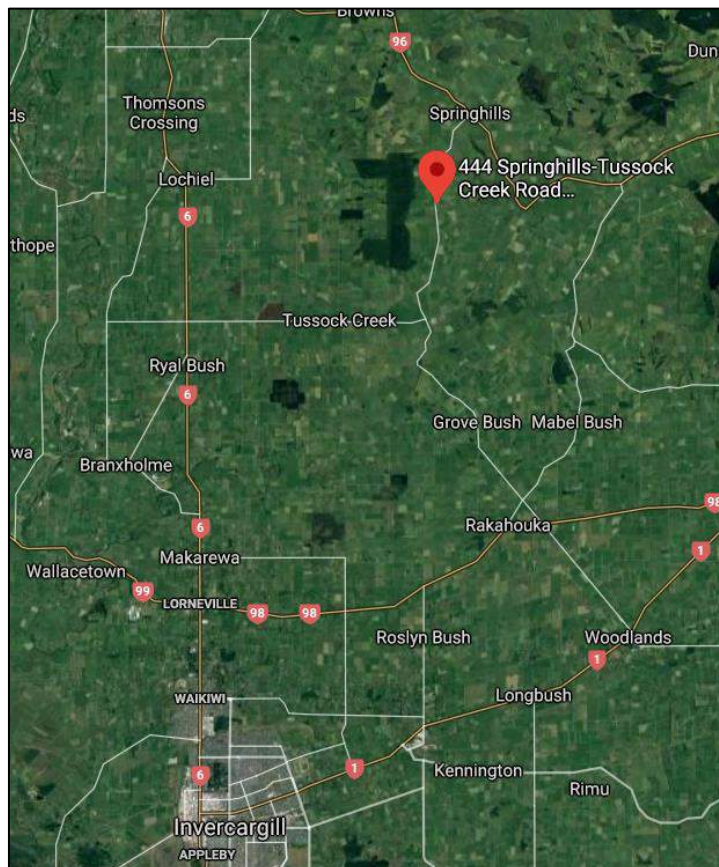
Applicant: Capil Grove Limited  
 Location: 444 Springhills-Tussock Creek Road, Springhills  
 Farm Area: 340.1 ha (315 ha effective)  
 Legal Description: Part Lot 2 DP 2005, Lot 1 DP 12811, Section 298 Forest Hill HUN, Lot 2 DP 13790, Lot 1 DP 4795, Section 517 Forest Hill HUN, Lot 3 DP 13790 and Lot 1 DP 13793  
 Map Reference: NZTM2000 1249823E 4872356N



## 3 RECEIVING ENVIRONMENT

### 3.1 Location

The 444 Farm lies within the Southland District at 444 Springhills-Tussock Creek Road, Springhills. The property location in relation to Invercargill is shown in Figure 3.1. Figure 3.2 shows the boundaries of the 444 Farm. The surrounding land is a rural farmed landscape. The 444 Farm and other properties have previously been managed as a dairy support, beef and high intensity sheep block, which has included sheep milking in the past.



**Figure 3.1: Property location**



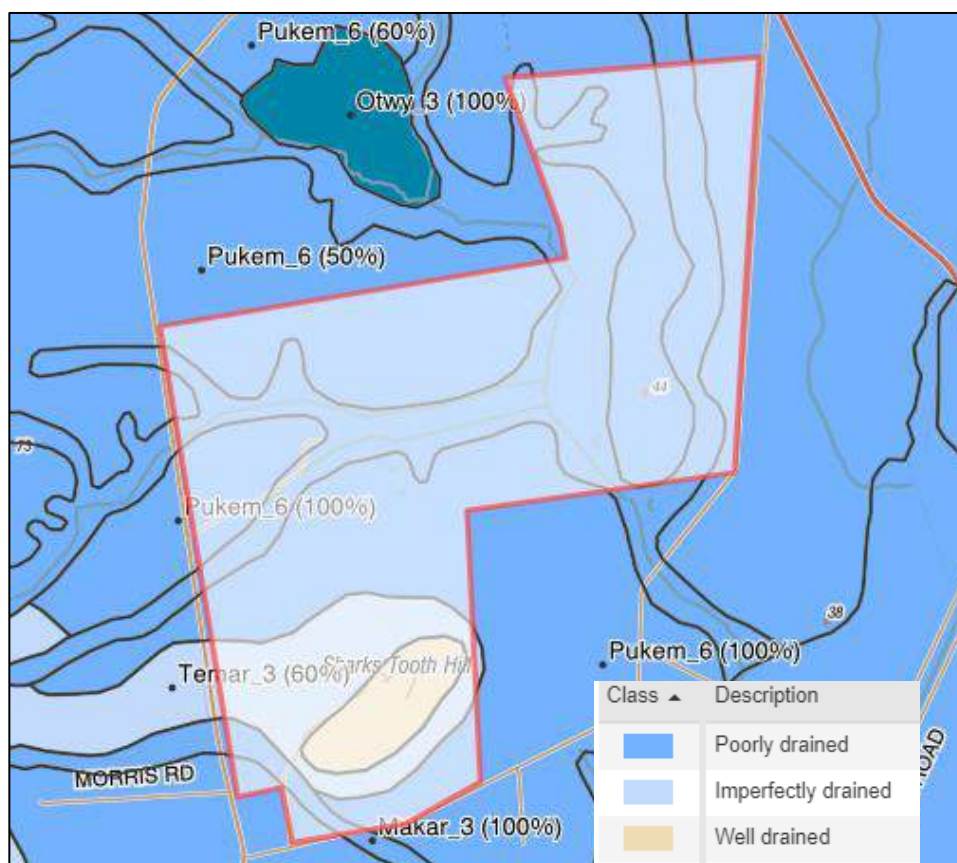
**Figure 3.2: Property boundary**

The 444 Farm (combined properties) has a total area of 340 ha (313 ha effective), comprising of the following titles: Part Lot 2 DP 2005, Lot 1 DP 12811, Section 298 Forest Hill HUN, Lot 2 DP 13790, Lot 1 DP 4795, Section 517 Forest Hill HUN, Lot 3 DP 13790 and Lot 1 DP 13793. Appendix A shows the farm map, outlining paddocks.

### **3.2 Topography, Drainage and Soils**

The topography of the farm is low rolling to easy hill country. The soils of the property have been assessed using S-Map. The soils on the farm are predominantly poorly drained, so the farm is drained by a network of subsurface drains. The location of the sub-surface drains is unknown but are assumed to be in all paddocks except on the hills of the Tuffin Block and Sharks Tooth Hill.

There are two main families of soil on this farm: Makarewa and Pukemutu (in association with Braxton). Table 3.1 below summaries the details of the soil types on the farm. A map showing the soil types is displayed in Figure 3.3. The majority of the property is poorly drained with a portion of the south eastern side of the farm being well drained.



**Figure 3.3: Soil types on farm**

**Table 3.1: S Map families located over the farms property (S-Map, 2020).**

S-Map Soil	Pukemutu	Makawera	Te Mara	Kuana	Braxton (secondary)
Classification	Perch-Gley Pallic Soil	Typic Orthic Gley	Mottled-Calcareous Orthic Melanic	Lithic Soil	Typic Orthic Gley Soil
Texture	Silt over clay	Silty Clay	Clay	Clay	Silty Loam Over Clay
Potential Rooting Depth	40 - 80 cm	40-90 cm	>100 cm	25-40 cm	Unlimited
Rooting Barrier	Pan	No Significant Barrier within 1 m	No Significant Barrier within 1 m	Massive Rock	Anoxic Conditions
Drainage Class	Poorly Drained	Poorly Drained	Imperfectly Drained	Well Drained	Poorly Drained
Profile Available Water	High (56 mm)	High (164 mm)	Moderate (40 mm)	Low (28 mm)	High (165 mm)
P Retention	22%	30 - 50%	29%	25%	30 -60%
Structure Vulnerability	High	High	Moderate	Low	Moderate
Water Logging Vulnerability	Very high	Very High	Very High	Very High	Very High
Drought Vulnerability	Moderate	Minimal	Moderate	High	Slight
N Leaching Vulnerability	Moderate	Slight	High	Very High	Slight
Relative Runoff Potential	Unknown	High	Unknown	Unknown	High



### 3.3 Physiographic Zones

The majority of the farm overlies the Gleyed Physiographic Zone (light blue), with the remaining area located in the Peat Wetlands (dark blue) and Bedrock/Hill Country Physiographic Zones (green) as shown in Figure 3.4 below.



**Figure 3.4: Physiographic zones on farm.**

Each physiographic zone has specific contaminant pathways. For the Gleyed zone, soils may accumulate and store nitrogen during summer and early autumn when soil moisture levels are low. Accumulated nitrogen starts moving with water when soils become wet in late autumn and winter and may be lost via artificial drains or overland flow on sloping topography. However, recent science shows there is a low risk of sediment, phosphorus and microbial loss to water on these soils. The main contaminant pathway for this zone is artificial drainage.

The Peat Wetlands Physiographic Zone is formed from rotted remains of wetland plants where there is a naturally high-water table above a poorly permeable rock. Drainage is required to lower the water table to support agriculture as a land use. Phosphorus loss is high as its poorly retained and runs over the soils easily. Contaminant loss through artificial drainage occurs in high rainfall or when the water table is near the surface. The main contaminant pathways for this physiographic zone are artificial drainage, deep drainage and lateral overland flow.

The Bedrock/Hill Country Physiography zone is land with bedrock or glacial till found near the surface, located below 800 m above sea level. The main contaminant pathways are overland flow, deep drainage and artificial drainage.



## 3.4 Climate

### 3.4.1 Rain and Evapotranspiration

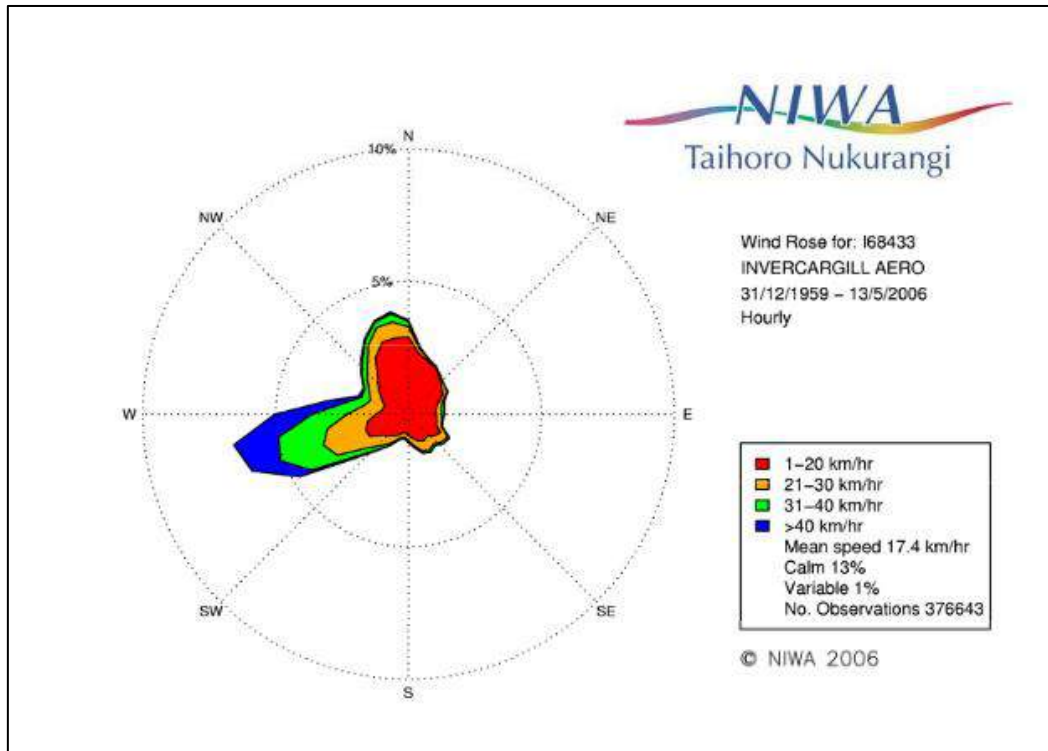
Daily rainfall data and daily potential evapotranspiration (PET) data are presented in Table 3.2 below. The nearest climate station with up to date records is 12 km away. The total rainfall for the area is an average 959 mm per year. The rainfall per month is relatively consistent ranging between 58 mm in August to 98 mm in May. The dryer months occur from July to September. Evapotranspiration exceeds rainfall November to February.

**Table 3.2: Monthly average climate data for Winton 1997 -2017.**

Month	Average Rainfall Total (mm)	Average PET (mm) (Total Penman)
January	91	106
February	72	83
March	77	63
April	78	33
May	98	15
June	82	8
July	66	11
August	58	24
September	74	45
October	86	72
November	86	91
December	82	103
Annual	959	653

### 3.4.2 Wind

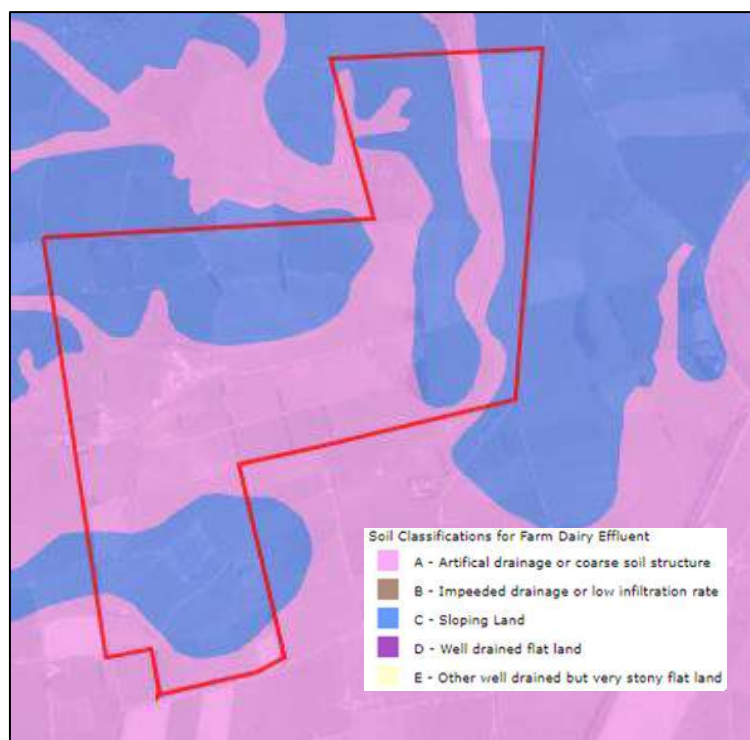
A windrose is shown in Figure 3.7 from Invercargill Aero climate station approximately 22 km south from Farm 444. This windrose is prepared from extensive data collected since 1959. It is assumed that Farm 444 will have similar wind activity to Invercargill. The strongest winds are recorded from the WSW direction. Winds up to 20 km/hr are generally from the north and west. Average winds are relatively light at 17.4 km/hr (4.8 m/s) however Figure 3.5 indicates that gusts can be much stronger.



**Figure 3.5: Windrose for Invercargill Aero from 1959 – 2006 (NIWA, 2006).**

### 3.5 FDE Soil Risk Classification

The farm has two different soil classifications based on Dairy NZ's FDE soil risk classification. These are Class A – artificial drainage or coarse soil structure and Class C – sloping land ( $>7^\circ$  slope), as shown in Figure 3.6. In this application both soils have been considered as high risk for FDE management.



**Figure 3.6: FDE Soil Risk Classification**





### 3.6 Surface Water

The farm is located in the Makarewa River catchment, within the Oreti Freshwater Management Unit (Land and Water Regional Plan).

There are small streams crossing the property, which are tributaries of the Makarewa River. The Makarewa River is approximately 1.3 km away to the northwest. The farm is within a high FDE surface water risk zone.

Water quality has been monitored for Makarewa River, downstream of the farm at the point where Hedgehope stream merges to Makarewa river; some 5 km from the farm. Details of water quality were sourced from the LAWA database (LAWA, 2022) and include the following:

- Black Disk Clarity has shown a 5-year median value of 0.91 m;
- Turbidity has shown a 5-year median value of 5.9 NTU;
- *E. coli* counts have shown a mean value of 485 n/100ml which puts it in the E NOF band (National Objective Framework);
- Total Nitrogen concentration has shown a mean value of 0.99 g/m<sup>3</sup>;
- Total Oxidised Nitrogen concentration has a median value of 0.61 g/m<sup>3</sup>;
- Total Phosphorus concentration has shown a mean value of 0.039 g/m<sup>3</sup>; and
- The five year median for Ammoniacal Nitrogen is 0.019 g/m<sup>3</sup>.

In-stream ecological health has been monitored at the sites. The macroinvertebrate community index (MCI) has a score of D for the last 5 years; this indicates a score between 80 and 99. Taxonomic richness measures the number of different taxa present in an ecological community. The site is showing an increasing trend in the number of taxa present since 2011, with a median of 19, however taxa levels have started to decline in last 3 years. EPT richness measures those fauna that are sensitive to water pollution (i.e. mayfly, stonefly and caddisfly). There is a 40% EPT richness at this site currently. EPT levels have decreased in last three years.

### 3.7 Groundwater Quality

The groundwater management zone that the farm occupies is the Makarewa. This is a lowland aquifer which covers 66,000 ha from the Makawera River catchment upstream of its confluence with the Oreti River to the base of the Hokonui Hills. The Makawera zone comprises of alluvial gravel deposits, accumulated by the Mataura River during the early Quaternary Period Environment Southland, (Not dated).

Groundwater is generally very shallow in the Central Plains aquifer ranging from <2 m to 10 m, increasing under higher alluvial terraces Environment Southland, (Not dated). This is evident on the Harwood Block where the unconfined aquifer pushes through to the surface. The allocation of this groundwater zone is low, meaning a low proportion of the unconfined aquifer has been allocated for abstraction Environment Southland, (Not dated).

Groundwater quality is generally good in the Makarewa groundwater zone, although it does vary according to the source aquifer and location. Groundwater in the gravel deposits can be susceptible to nutrient enrichment, although it does generally remain within the acceptable limits set by the drinking water standards.

The farm is in a moderate groundwater FDE risk area.



### **3.8 Existing Bores and Consents**

There are no existing bores within the property boundary. The closest bores are across the road to the west on the boundary of the neighbour's property (Well E46/1439 and Well E461450) (Environment Southland, 2022). Both bores have had casing retrieved and abandoned.

CGL were granted the following consents recently (June 2021):

- Consent to use land for dairy support land (AUTH-20211143-01);
- A discharge permit to discharge agricultural effluent to land (AUTH-20211143-02);
- Consent for the use of land for the construction, maintenance and use of a new agricultural effluent storage facility (AUTH-20211143-03); and
- Consent for the use of a 456 cow wintering barn (AUTH-20211143-04).

There is one expired discharge consent (AUTH-205665) which expired in 2019 and allowed the discharge of agricultural effluent from 3,000 milking ewes.

### **3.9 Amenity, Cultural, Heritage and Community Values**

The properties are in fee simple title, and there is no public access entitlement onto the property.

There are no known cultural or archaeological sites, nor traditional communal activities that take place on or near the property that could be in any way affected by the proposed activity. No heritage buildings are recorded in this locality. There are no schools, maraes, hospitals, or other community facilities near enough to be affected by the proposed activity. There are no regionally significant wetlands on the farm.



## 4 ACTIVITY DESCRIPTION

### 4.1 Scope of Activity

Capil Grove Limited would like to seek consent for the for the following:

- Consent to convert land and use the farm for dairy cow milking;
- Variation to discharge permit AUTH-20211143-02 for the application of dairy effluent to the whole property (except Shark's Tooth Block);
- Variation to land use consent for the construction, maintenance and use of an effluent storage pond for the storage of agricultural effluent permit AUTH-20211143-03;
- Variation to land use consent AUTH-20211143-04 for the use of a wintering barn; and
- Consent for taking of groundwater.

Table 4.1 summarises the current consents granted, the changes required for this proposed application and the future consents required to farm under a dairy milking operation.

**Table 4.1: Current consents, changes required and future requirements to be farmed under a dairy milking operation.**

Current	Changed Required	Future
<b>Land use consent:</b> Use of land for dairy support use (AUTH-20211143-01).	Will be maintained to enable cows from the Capil grove property to be housed in the wintering barn.	<b>Land use consent:</b> Use of land for a 640 cow dairy milking operation plus the addition of 200 cows. (RWP Rule 17A)
<b>Discharge permit:</b> To discharge wintering barn effluent to land via low rate pod system and a slurry tanker (AUTH-20211143-02).	Variation to discharge wintering barn and dairy shed effluent to land over the whole farm (except Shark's Tooth Block) via low rate pod system and a slurry tanker.	<b>Discharge permit:</b> To discharge wintering barn and dairy shed effluent to land via low rate pod system and a slurry tanker.
<b>Land use consent:</b> To construct, maintain, and use a 5,000 m <sup>3</sup> effluent storage pond for the storage of agricultural effluent (AUTH-20211143-03).	Variation to increase pond size from 5,000 m <sup>3</sup> to 17,800 m <sup>3</sup> .	<b>Land use consent:</b> To construct, maintain, and use a 17,800 m <sup>3</sup> effluent storage pond for the storage of agricultural effluent.
<b>Land use consent:</b> Use of land for a wintering barn (AUTH-20211143-04).	Variation to allow for an extra wintering barn.	<b>Land use consent:</b> Use of land for two wintering barns to hold up to a combined number of 956 cows.
		<b>Groundwater Take:</b> Groundwater take for a peak use of 85,800 L/day at a rate of no more than 2L/s

### 4.2 Proposed Activity – Dairy Conversion

CGL have recently purchased two neighbouring properties to the 444 Springhills-Tussock Creek Road property and wish to convert them to a dairy farming property.

In June 2021, CGL applied for and was granted consents to run up to 456 dairy support cattle which would be housed in a wintering barn over winter. The current effluent ponds and the installation of a new 5,000 m<sup>3</sup> pond would allow them to store effluent and apply when soil conditions are suitable. However, CGL now wish to milk up to 640 dairy cows as they can increase



production while improving the environmental credentials on the property from the previous farming systems. They wish to also house 200 cows from the close by Capil Grove property over winter. They would do this by constructing a new wintering barn to house the extra cows and by installing a proposed 17,800 m<sup>3</sup> pond instead of the granted 5,000 m<sup>3</sup> pond. This will allow for the capture and storage of effluent not only in June and July, but also in times where the soil temperatures are low and soils are saturated (or just overly wet) outside of the winter months. Upon installation of the new pond, the existing ponds would be decommissioned. The effluent would continue to be applied at low application rates as described in Section 6 of this application.

Changes to implement the dairy farm will happen over time. A description of different stages has been outlined below. A contributor to this staging process is 50 ha of the original 444 Farm being leased to the previous owners who are running sheep on the property, as well as the installation of a new 17,800 m<sup>3</sup> pond and the construction of a new wintering barn to house the extra cows. Four stages are described below in Table 4.2 below

**Table 4.2: Proposed farming system over four stages.**

<b>Stage 0 – Baseline (All farms)</b>	<b>Stage 1 – Current Ponds, 50 ha leased to previous owners</b>	<b>Stage 2 – Conversion to milking. Lease continues.</b>	<b>Stage 3 – Installation of new 17,800 m<sup>3</sup> pond, installation of a second barn. Lease continues.</b>	<b>Stage 4 – After 4 years, lease is finished, and cow numbers increased.</b>
All farms as per their previous farming operations which is described in Section 1.1.	Dairy support system running up to 220 dairy support cows. This is the current effluent storage capacity of the existing ponds. This was outlined and granted consent in June 2021 (AUTH-20211143-01) and is shown in Table 4.3 below.	The 220 dairy support cows that are wintered in the barn will stay on the property and be milked. The current ponds will provide sufficient storage for these cows to be milked as shown in Appendix F.	Up to 505 cows being milked by CGL, with up to 200 cows from Capil Grove Farm in the barns over winter. A peak of 1,171 sheep are being run on the lease block by the previous owners. The 505 cows are determined to be the number of cows that can be managed on the property without causing a detrimental effect on the environment while the sheep are on the property, as determined by nutrient losses modelled in OverseerFM.	No lease and up to 640 cows being milked. With up to 200 cows from Capil Grove Farm housed in the wintering barns over winter.

Stage 0 is what was occurring on each property prior to the Applicant’s purchase. These have been modelled under one nutrient model to establish the Baseline. The description of past farming operations for each farm prior to purchase by the Applicants is described in Section 1.1.

Stage 1 is what currently takes place on Farm 444 under consent AUTH-20211143-01. There are up to 220 cows in the wintering barn over winter as dry cows. An area of 50 ha remains as a sheep block and leased back to the original owners.



At Stage 2, the dairy support cows that have been brought to Farm 444 from Capil Grove Farm under consent AUTH-20211143-01 will stay on the property after spending the winter as dry cows. By September, those 220 cows will stay on the property following calving and be milked as Farm 444 cows. As there are only 220 cows, the circular yard will be used (550 m<sup>2</sup> as shown in Table 4.6 below). The other rectangular yard will not be used and rainwater that falls on this yard will be diverted from the yard, with some captured into a rainwater tank. The lease area will continue.

At Stage 3, a new pond and new wintering barn will be installed. The current ponds will be decommissioned. The 50 ha lease area will remain as a sheep block and leased back to the original owners. There will be 505 cows on the property during the time the lease block is used for sheep grazing.

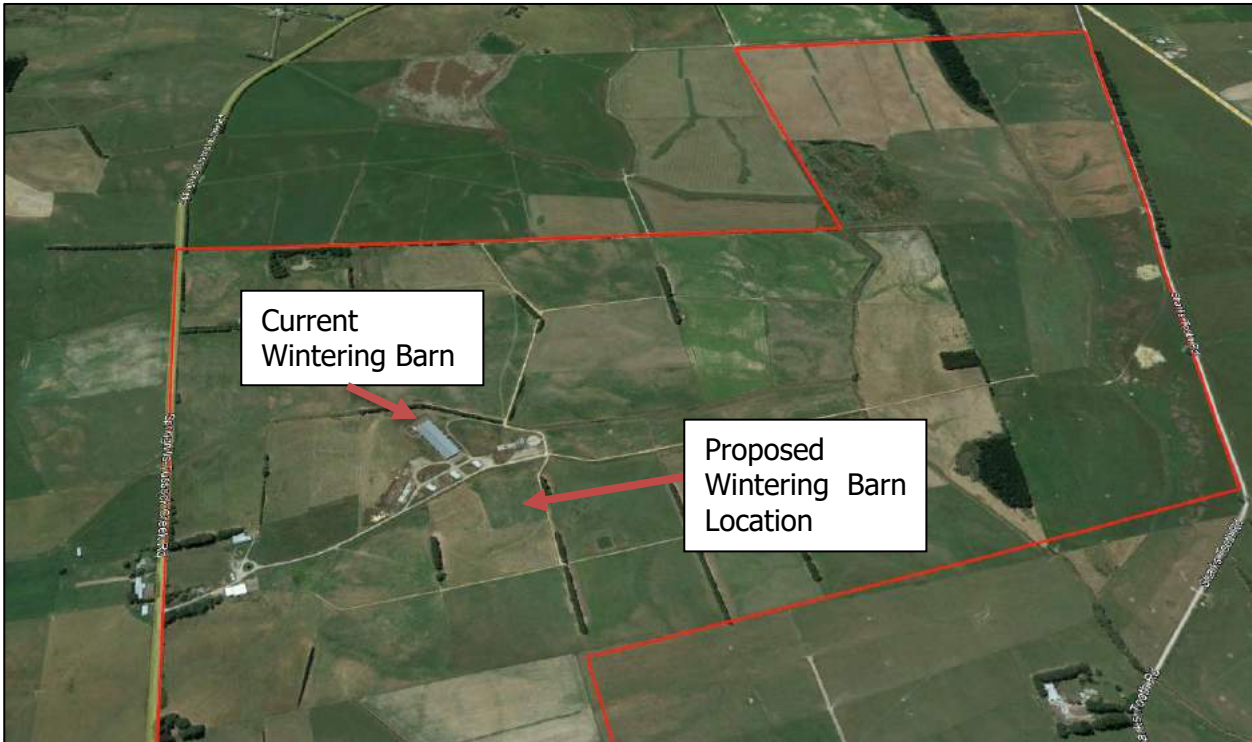
At Stage 4 the sheep lease will end. CGL would milk up to 640 cows year round. In addition, it is proposed that 200 Capil Grove Cows will also be wintered in the wintering barns. This is made possible as there is no need for crops (and grass) to be grown and grazed over winter due to wintering barns that can be utilised to feed supplements in and capture effluent to minimise environmental impacts. Barley grain will be grown for supplements in October through to March. The grain will be harvested, stored, and fed back to stock in the milking shed. This allows CGL to reduce negative impacts on the environment by not having to import grain on to the property, but also have the barley utilise extra phosphorus reserves from the soil that could otherwise runoff from the system in early autumn.

A Farm Management and Conversion Environment Plan for the property has been produced and outlined in Appendix B.

### **4.3 Wintering Barn**

The current wintering barn is located approximately 600 m from the farm gate, as shown in Figure 4.1 below. The barn is sealed and can hold up to 333 cows if set up as a loose house barn structure or up to 456 cows when set up as a free stall barn system. The barn dimensions are 34 m x 135 m and the barn was constructed in 2010.

The proposed location of the new wintering barn is also shown in Figure 4.1. The barn will also be sealed and will have the ability to hold 500 cows as a free stall barn system. The barn dimensions proposed are 36.5 m x 120 m.



**Figure 4.1: Location of the current and proposed wintering barns at 444 Springhills-Tussock Creek Road Farm**

Table 4.3 outlines how the current wintering barn is proposed to be used before the installation of the new pond. Cow number, hours per day and days per month are three variables that determine usage per month.

Initially the cow numbers in the barn will be limited to the capacity of the existing pond system. These will be dairy support cows (as covered by the existing consent) until they are milked following calving in September when they become milking cows. The proposed numbers for the existing system are:

**Table 4.3: Use of wintering barn – existing effluent storage.**

Month	Cow Numbers	Average Hours per day
May	55	16 – 20
June	220	18 – 24
July	205	18 – 24
August	70	16 – 24
September	30	12 – 20

It is proposed that these cows will be housed for **up to** 24 hours per day over the entire month for June, July and August only. In May and September, cows will be housed for part of the day/month depending on soil and climatic conditions at the time. The barn may also be used intermittently throughout the year on the occasion of a severe weather event to help protect soils.

The current wintering barn can be configured to hold up to 456 cows once a new pond is installed. Following the construction of the new proposed wintering barn, all 640 cows can be housed over winter as well as 200 cows from Capil Grove Farm. The combined barns have the ability to hold up to 956 cows. Again, it is proposed that these cows can be housed for **up to** 24 hours per day over the entire month for June, July and August only, with cows also housed in May and



September depending on soil and climatic conditions at the time. This scenario is Stage 4 as summarised above in Table 4.2. The average usage in May and September is represented in the table below.

**Table 4.4: Use of the current and proposed wintering barns.**

Month	Combined Cow Numbers	Approximate Hours per day
May	640-840	16 – 20
June	840	18 – 24
July	840	18 – 24
August	840	16 – 24
September	640-840	12 – 20

#### 4.4 Effluent Discharge System

The effluent discharge system on 444 Farm currently comprises of the current barn, a small outside yard at the side of the barn, a weeping wall and existing pond storage facilities. The current main facilities associated with effluent collection on this property are shown in Table 4.5. An additional pond of 5,000 m<sup>3</sup> has also been granted to be installed, however CGL wishes to vary this to 17,800 m<sup>3</sup> for the reasons stated above.

There are two existing yards that will be utilised when milking the cows. These are located next to the existing milking shed (shown in Figure 4.2) and are a total of 420 m<sup>2</sup> (rectangular yard) and 550 m<sup>2</sup> (circular yard). These are not currently used and water is diverted, The yards will be used in future. The effluent management areas that will be associated with the effluent collection following the installation of the new 17,800 m<sup>3</sup> pond are shown below in Table 4.6.

**Table 4.5: Yard and effluent management areas before the installation of the new pond.**

Description	Total Area (m <sup>2</sup> )	Outside area contribution to FDE system (m <sup>2</sup> )	Total Pumpable Volume
Wintering Barn (Covered)	4,590		
1 <sup>st</sup> Weeping Wall and Solid Storage Area		16 m x 18 m = 288 m	
Effluent Pond 1			923 m <sup>3</sup>
Effluent Pond 2			882 m <sup>3</sup>
Sludge Bed/ 2 <sup>nd</sup> Weeping Wall		8 m x 33 m = 264 m	
<b>Total</b>	<b>4,590</b>	<b>552</b>	<b>1,805 m<sup>3</sup></b>



**Table 4.6: Yard and effluent management areas following the installation of the new pond.**

Description	Total Area (m <sup>2</sup> )	Outside area contribution to FDE system (m <sup>2</sup> )	Total Pumpable Volume
Milking Shed	404		
Circular Yard		550	
Rectangular Yard		420	
Current Wintering Barn (Covered)	4,590		
Proposed Wintering Barn (Covered)	3,650		
1 <sup>st</sup> Weeping Wall and Solid Storage Area		16 m x 18 m = 288 m	
Additional Yard Area		12m x 35m = 420 m	
Sludge Bed/ 2 <sup>nd</sup> Weeping Wall		8 m x x 33 m = 264 m	
New Storage Pond (to be installed)			17,800 m <sup>3</sup>
<b>Total</b>	<b>8,644</b>	<b>1,658</b>	<b>17,800 m<sup>3</sup></b>

Figure 4.2 shows the overall layout of the existing effluent treatment and storage system.

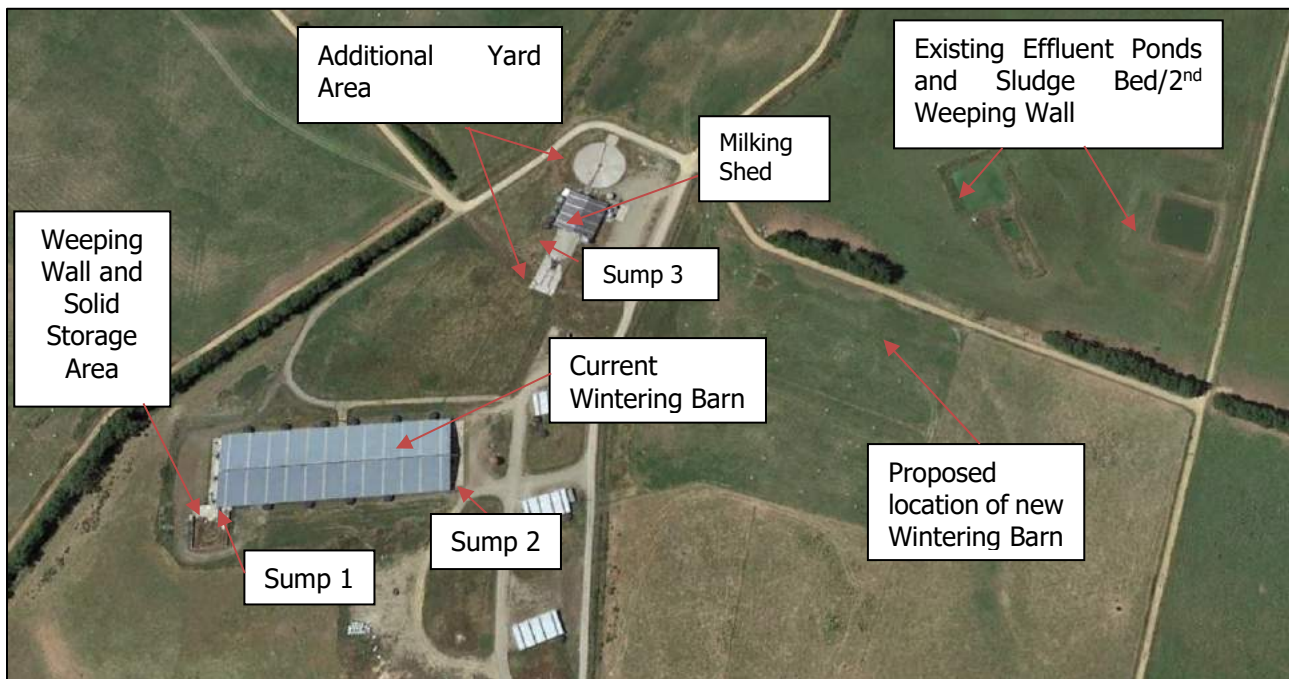
A rainwater diversion is always used for rainwater collected on the barn roof. Effluent and slurry generated from the current wintering barn (4,590 m<sup>2</sup>) is scraped using a chain scraper into a strip drain at northeast end of the barn. There is a conveyor chain that will take the effluent and slurry from the chain scraper through into the 1<sup>st</sup> weeping wall and associated solid storage area (288 m<sup>2</sup>). This weeping wall is above ground level and has a drain around the outside that flows the liquid effluent into a covered sump (Sump 1) beside the storage area. There is also another covered sump at the other end of the barn (Sump 2) and outside yard area (136 m<sup>3</sup>) to capture any additional liquid that runs out of the barn. The new barn is proposed to be operated in the same way, where solids are scraped through to a weeping wall and pumped to the new proposed pond.

Effluent and washdown from the from the 24 aside herringbone shed and the yard areas which are used for holding cattle before being milked and for sorting stock (circular and rectangular) will drain to a wedged stone trap at the shed. This then flows to a 10 m<sup>3</sup> sump at the shed. Effluent and slurry from the sump is then pumped through to the 2<sup>nd</sup> weeping wall/sludge bed, where liquids will be pumped to the new 17,800 m<sup>3</sup> effluent pond for storage and ultimate application to land when soil conditions are suitable.

Effluent from the ponds is proposed to be applied to land either via slurry tanker or via K-line-Max70 pods. The pods are fitted with an electronic failsafe to automatically shut down the pump if there is a sudden pressure drop or increase. Solid material from the associated structures is to be spread to land using muck spreader.

Photos of the effluent system can be found in the Effluent Management Plan attached to this application, as Appendix C.





**Figure 4.2: Overview of layout showing barn and effluent treatment system at 444.**

## 4.5 Effluent Storage Ponds

### 4.5.1 Existing Ponds

There are two existing ponds and a sludge bed on the farm associated with the original sheep milking effluent discharge that expired in June 2021. Environment Southland granted Consent AUTH-20211143-03 for the use of the existing ponds for storage of agricultural effluent as part of the dairy support land use consent which saw the use of the barn.

Effluent Pond 1 (Bottom Pond) was constructed in 2008 and is 26 m x 26 m, with a depth of 3 m, 0.5 m of freeboard and internal batters of 2:1. The effective pumpable storage volume is 923 m<sup>3</sup>. Effluent Pond 2 (Top Pond) was constructed in 2010 and is also 26 m x 26 m, but with a depth of 2.8 m giving a pumpable volume of 882 m<sup>3</sup>. Both ponds will be decommissioned following the installation of the new pond.

The sludge bed is 30 m x 8 m, with a 1 m depth and 1:1 internal batter, with the ability to hold 203 m<sup>3</sup>.

The ponds and sludge bed are clay lined and have been certified by a suitably qualified person prior to use. Drop tests were conducted and results are found in Appendix C of the original application, as well as the dairy effluent storage calculator (DESC) outputs in Appendix E. The ponds will meet the requirements of Appendix P of the Proposed Southland Land and Water Plan.

An Effluent Management Plan is attached in Appendix C, which outlines the maintenance, monitoring and operation of the storage ponds and associated infrastructure.

### 4.5.2 Design of New Pond

A variation to increase the size of the pond to 17,800 m<sup>3</sup> is proposed. The pond will be synthetically lined and designed to NZ design standards IPENZ Practice Note 21 or 27. The pond will meet the required leak detection or pond drop test requirements of Appendix P of the



Proposed Southland Land and Water Plan prior to use. The proposed location of the pond is shown in Figure 4.3 below.

The proposed additional pond and its design plans are provided in Appendix D. The location is an appropriate distance from waterways, bores, neighbouring dwellings and the property boundary. The pond has been designed for sufficient storage for the proposed number of dairy cows when it is at full capacity (note that a pond volume of 16,200 m<sup>3</sup> is actually needed). The output of the dairy effluent storage calculator for the proposed cow milking system is in Appendix E of this application. The size allows effluent to be applied when soil and climatic conditions are suitable and to store effluent from Mid-May to Mid-September.



**Figure 4.3: Proposed location of the new 17,800 m<sup>3</sup> pond.**

## 4.6 Effluent Discharge

The liquid effluent (FDE) is proposed to be applied to land from the storage ponds via either:

- a) low rate pods; or
- b) slurry truck with spreader bar.

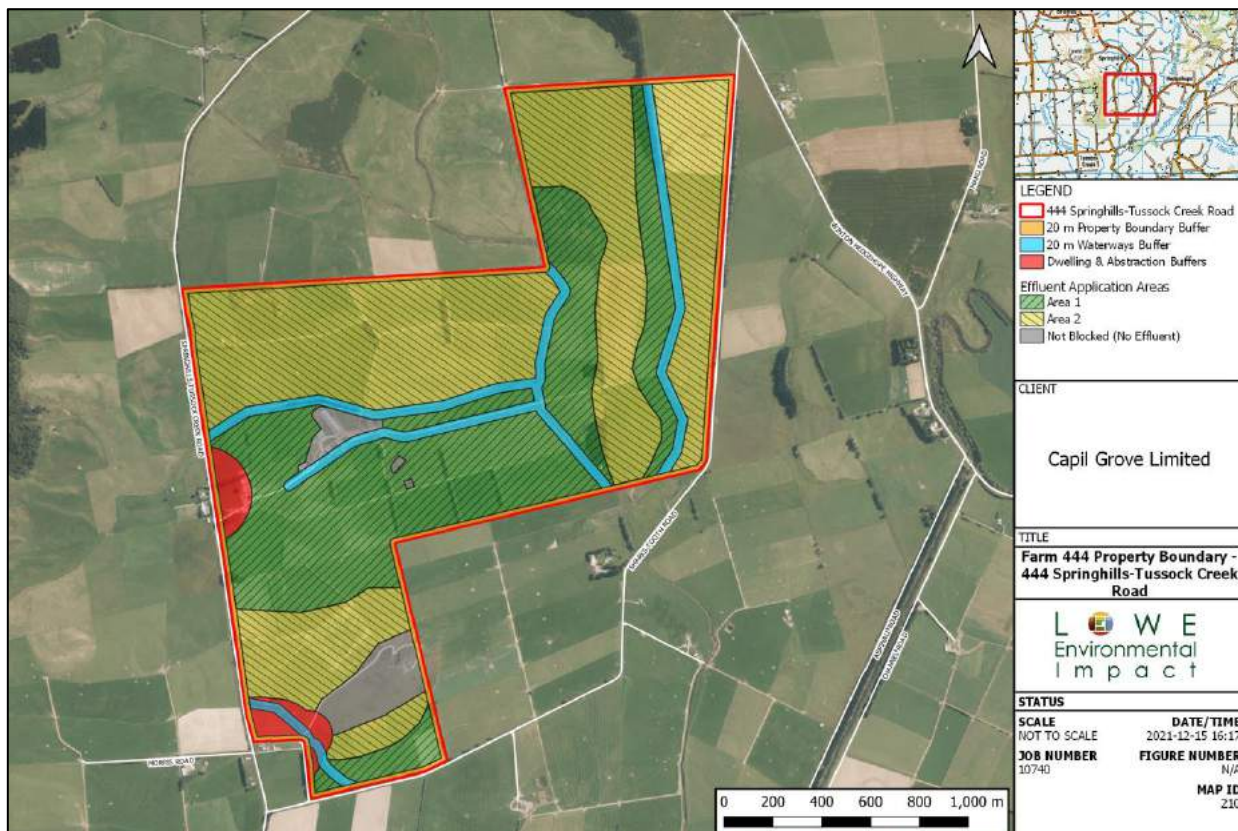
The solids from the weeping wall are proposed to be applied via slurry tanker/muck spreader to land every year in November/December or as required, as a permitted activity.

It is proposed to apply effluent over the whole farm (except Shark's Tooth Block), with buffers in place. The proposed buffers are:

- (a) 20 m of any surface watercourse;
- (b) 100 m of any water abstraction point;
- (c) 200 m of any residential dwelling other than residential dwellings on the subject property; and
- (d) 20 m from any property boundaries.



As a result, there is approximately 280.8 ha of potential effluent area on the property. The potential effluent area is shown below in Figure 4.4.



**Figure 4.4: Effluent discharge area.**

The effluent irrigation area is split into FDE risk profiles, being A & C land categories. In the map above (Figure 4.3) Area 1 represents Category A land and Area 2 represents Category B land. The proposed effluent irrigation methods discussed below reflect the different soil risks.

The proposed discharge shall not exceed the following rates at any time on:

Area A (Category A Land):

- a) For the low rate pod system, a maximum depth of application of 25 millimetres for each individual application, at an instantaneous rate not exceeding 10 millimetres per hour; and
- b) For the slurry tanker A maximum depth of application of 5 millimetres for each individual application, in accordance with Rule 50(d) of the Regional Water Plan.

Area B (Category C Land):

- a) (a) For any low-rate pod system a maximum depth of application of 10 millimetres for each individual application, at an instantaneous rate not exceeding 10 millimetres per hour; and
- b) (d) For the slurry tanker a maximum depth of application of 5 millimetres for each individual application.

A maximum loading rate of nitrogen onto any land area is proposed. The nitrogen loading shall not exceed 150 kilograms of nitrogen per hectare per year (kg N/ha/y).



There shall not be any surface runoff/overland flow, ponding or contamination of water resulting from the exercise of this proposed consent and no odour or spray drift beyond the boundary of the site that is offensive or objectionable. It is also proposed that the application of FDE at times when available water holding capacity of the receiving soil does not exceed the planned FDE application depths, using reference soil moisture monitoring data from Environment Southland monitoring sites or via on-farm soil moisture monitoring. Allowing applications to occur only when there is a soil moisture deficit will ensure that drainage through to the artificial network to groundwater will be avoided. The proposed storage pond of 17,800 m<sup>3</sup> will provide sufficient storage when milking 640 cows and wintering 200 cows in the barn over winter from Capil Grove Farm. This will allow for storage over all winter months if required and also allow for extended storage in May and September if the soils are saturated and temperatures are cold. There is sufficient pond storage capacity to allow for deferred irrigation when soil conditions do not have a soil moisture deficit. No applications of effluent are proposed to occur in June and July.

The proposed application depths are in line with application depths for low-rate tools based on the FDE soil risk classifications for the soils on this farm, as shown in Figure 4.5.

Category	A	B	C	D	E
Soil and landscape feature	Artificial drainage or coarse soil structure	Impeded drainage or low infiltration rate	Sloping land (>7°) or land with hump & hollow drainage	Well drained flat land (<7°)	Other well drained but very light flat land (<7°)
Risk	High	High	High	Low	Low
Application depth (mm)	< SWD <sup>1</sup>	< SWD	< SWD	< 50% of PAW <sup>2</sup>	≤ 10 mm & < 50% of PAW <sup>2</sup>
Storage requirement	Apply only when SWD exists	Apply only when SWD exists	Apply only when SWD exists	24 hours drainage post saturation	24 hours drainage post saturation
Max depth: High rate tool	10 mm	10 mm	10 mm <sup>3</sup>	25 mm <sup>4</sup> (10 mm at field capacity)	10 mm
Max depth: Low rate tool	25 mm	25 mm	10 mm	25 mm	10 mm

**Figure 4.5: FDE application guide (Dairy NZ).**

Effluent applications are only carried out when conditions are suitable. As discussed above, the application of effluent to land shall not occur when the moisture content of the soils is at or above field capacity, based on scheduling by continuing to use data from Environment Southlands soil moisture site at Woodlands or improved via on farm soil moisture monitoring.

For the liquid effluent (FDE), when using the low-rate pods, there is an effluent mono pump in the shed near the storage pond. The pump is manually switched on by the operator and automatically switches off. If the pressure in the line drops due to a hose burst or leak, the pump will automatically switch itself off. It will also shut down if high pressure is detected such as if there was a blockage in the line.

Application via the slurry tanker will be at a low depth and will be actively monitored by the tractor operator.

An Effluent Management Plan has been prepared that outlines management, maintenance and monitoring of the effluent discharge system and emergency procedures. A copy of the effluent management plan can be found as Appendix C. The Effluent Management Plan shall be reviewed



at least on an annual basis to check that it still accurately reflects on-site activities and whether any improvements to management procedures need to be made. If/when the plan is amended, a copy of the amended version shall be sent to the Consent Authority as soon as practicable following amendment. A daily record of all discharges is kept in the effluent shed.

#### **4.7 Nutrient Losses**

A total effluent nitrogen load limit across the farm of 150 kg N/ha/y is proposed.

This loading rate will be managed through a spreading plan which identifies and outlines paddocks that have received other forms of nutrients and paddocks. It is proposed that records will be kept of where, when and how much FDE is applied. The location of applications will change to suit wet weather conditions, stock grazing or other farming activities. The spreading of dry solids (muck spreader) and all discharges made by either the slurry tanker or K-line pods are made to paddocks around the farm in accordance with the relevant effluent management and discharge plan.

A nutrient budget has been prepared in OverseerFM showing the potential impact of the wintering barns and proposed effluent system, in comparison to the previous combined farming operations (baseline). The modelling results are discussed further in Section 6. The farm has an existing Farm Environmental Plan which has been updated for this application. As the application is for a conversion to dairy farming, and a Farm Environmental Plan as well as an effluent management plan have been provided, the Conversion Plan has been combined with the Farm Environmental Plan as this makes for ease of reading when the plans contain much of the same information. This has been called Farm Management and Conversion Environment Plan and can be found in Appendix B of this application.

FDE applications are not new on this farm. The farm has previously had consent to apply effluent from a sheep milking system. More recently consent was granted to apply effluent from the barn operation.

Nitrogen losses from the proposed dairy conversion are lower than the previous farming operations combined. This is due to the use of the wintering barns which allows for the collection of effluent during winter months; providing the opportunity for even application of nutrients when conditions are suitable. Soils are also not physically damaged over the winter months as no stock would be grazing in times where it is raining, and soils are saturated. There is also no intensive grazing proposed to be happening on the property.

#### **4.8 Groundwater Take and Use**

The applicant is proposing to take water from a spring at NZTM 1250135E, 4871243N located on Sharks Tooth Block. A spring is considered groundwater under Appendix L of the Southland Regional Land Plan. The location of take is shown below in Figure 4.6.



**Figure 4.6: Location of the proposed groundwater take.**

The spring has been used in the past before for stock drinking water, however this was not consented as the take was less than 20,000 litres per day and less than 2 L/s. The proposed take is for a peak volume of 85,800 and a rate of 2 L/s. The peak volume is only expected during winter when the extra cows are brought on the property from Capil Grove Farm and require drinking water. It is expected that the peak volume during the rest of the year would be 76,800 L/day.

The farm has a total of twenty seven 30 m<sup>3</sup> freshwater tanks around the dairy shed, the wintering barn and other buildings in the area. These tanks can collect rain water and will provide water for general farming activities such as cleaning of farming equipment, calfateria and spray units, and also any other water where required. They will supplement the groundwater supply from the spring.

The spring water is currently pumped to a holding tank on the top of Shark Tooth Hill via a 40 mm alkathene pipe. It is then gravity feed to the property via a 50 mm pipe, from where there is a network of 32 mm pipes. There are one or two troughs in each paddock which are fed from the 32 mm pipes. Appendix G shows the water distribution infrastructure on this farm. It is intended that a new pipe would be laid which will take water directly from the spring to the tanks at the cowshed so the water would not have to be pumped via the tank on Shark's Tooth Hill now that the recently purchased Harwood Block becomes part of Farm 444.



The proposed water use for Farm 444 for shed water and stock drinking water is shown in Table 4.7 and 4.8. These calculations are based on Dairy NZ calculations for FDE design code of practice and Horizon Regional Council's Reasonable Stock Water Requirements – Guidelines for Resource Consent Applications (DairyNZ, 2015. HRC, 2007). Drinking water for the Capil Grove Farm cows is expected to be lower than the peak use for Farm 444 cows as these are dry cows, under cover in winter when temperatures are lower. These cows are expected to drink a conservative estimate of 45 L/day.

**Table 4.7: Water use calculation for drinking and shed water use.**

	<b>Peak use per day</b>	<b>Total days per year at peak use</b>	<b>Average per day per annum</b>	<b>Total per year</b>
Cowshed Water Use	32,000	60	25,600	9,344,000
Cow Drinking Water	44,800	60	32,000	11,680,000
Yearly Total			<b>57,600</b>	<b>21,024 m<sup>3</sup>/yr.</b>

**Table 4.8: Water use with 200 Capil Grove Farm Cows**

	<b>Number of Cows</b>	<b>Average Drinking water (HRC, (2007))</b>	<b>Total</b>
Cow Drinking Water	200	45 L/cow/d	
Average Peak Daily Total		9 m <sup>3</sup> /d	
Yearly Total (approx. 90 days on Farm)			810 m <sup>3</sup> /yr.
Farm 444 Milking Cows	640		21,024 m <sup>3</sup> /yr.
Yearly Total			<b>21,834 m<sup>3</sup>/yr.</b>

It is expected that the total yearly take volume will be 21,834 m<sup>3</sup>.

The take location associated with this consent has a back-flow prevention and a water meter installed at point of take to ensure compliance with proposed abstraction volumes. The meter is located in the line from pump to tank.



## 5 STATUTORY CONSIDERATIONS AND CONSENTS REQUIRED

### 5.1 Introduction

The provisions of The Regional Water Plan (RWPS), The Proposed Southland Water and Land Plan (PSWLP), The Regional Effluent Land Application Plan (RELAP), and the National Environmental Standards for Freshwater (NES-F) are discussed in this section. This includes an assessment of the activities against the relevant rules of the statutory plans.

### 5.2 Rule Assessment

#### 5.2.1 Regional Water Plan for Southland 2010

The Regional Water Plan applies to all discharges of effluent and sludge onto or into land in the region. It became operative in 2010. The relevant rules that relate to this proposal are Rules 17A, Rule 23, Rule 49 and Rule 50.

Rule	Assessment
<p><b>Rule 16 - Discharges associated with stock access to surface water</b></p> <p>Except as provided by Rule 17, the discharge of any contaminant into water, or onto or into land in circumstances where it may enter water, associated with:</p> <p>(a) the disturbance of the bed of any lake, river, modified watercourse or stream arising from stock access permitted under Rule 42(a); or</p> <p>(b) stock access to any other surface water;</p> <p>is a permitted activity provided the following conditions are met:</p> <p>(a) for artificial watercourses, the discharge (either by itself or in combination with the same, similar or other contaminants) does not give rise to any or all of the following effects in the receiving water after reasonable mixing:</p> <p>(i) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;</p> <p>(ii) any conspicuous change in the colour or visual clarity;</p> <p>(iii) any emission of objectionable odour;</p> <p>(iv) the rendering of fresh water unsuitable for consumption by farm animals;</p> <p>(v) any significant adverse effects on aquatic life;</p> <p>(b) for surface water bodies, the activity shall not reduce the water quality below any standards set for the relevant surface water body in Appendix G "Water Quality Standards" after reasonable mixing;</p> <p>(c) for artificial watercourses, in addition to the requirements specified in condition (a), the activity shall not reduce the water quality of the surface water body into which the artificial watercourse flows below any standards set for the surface water body in Appendix G "Water Quality Standards" following a zone of reasonable mixing from the point of confluence of the artificial watercourse with the surface water body</p>	<p><b>Not relevant</b> – Stock do not have access to water as all waterbodies are fenced off to exclude stock.</p>





Rule	Assessment
<p><b>Rule 17 - Stock grazing and access to surface water</b> Grazing or access of stock within:</p> <p>(a) 3 metres horizontally of water in a lake, river, modified watercourse, stream or artificial watercourse, when intensive winter grazing is being undertaken; or</p> <p>(b) any Natural State surface water body; or</p> <p>(c) any Regionally Significant Wetland identified in Appendix B that is on public conservation land managed as such under the National Parks Act 1980, Conservation Act 1987 or the Reserves Act 1977; is a non-complying activity.</p>	<p><b>Not relevant</b> – This rule is not relevant as intensive winter grazing is not taking place on the property.</p>
<p><b>Rule 17A – Transitional rule relating to the establishment of new dairy farms</b></p> <p>a) The establishment of a new dairy farm is a discretionary activity.</p> <p>(b) Subject to (c) an application for resource consent under (a) does not need to be notified or served on any person unless the applicant requests or the Council considers that special circumstances warrant notification.</p> <p>(c) Notwithstanding (b), notice of an application under this rule shall be served on the following:</p> <p>(i) Te Runanga o Ngai Tahu and the appropriate runanga.</p> <p>(ii) The Department of Conservation for an application that adjoins a national park or conservation area administered by that department.</p> <p>(iii) The Gore District Council for an application within that area of the Knapdale Groundwater Zone identified on the Knapdale Groundwater Map.</p>	<p>The proposed new conversion to dairy farming is a <b>discretionary activity</b> under part a) of this rule.</p>
<p><b>Rule 23 – Abstraction and use of groundwater</b></p> <p>(d) Except as provided for in Rules 23(a) and 23(b) and the takes authorised by Section 14(3) of the Act, the abstraction and use of groundwater from any of the following sources is a discretionary activity:</p> <p>(i) a riparian or terrace aquifer where the total volume of water allocated from the relevant groundwater zone is between 25 and 50 percent of mean annual land surface recharge;</p> <p>(ii) a lowland aquifer where the total volume of water allocated from the relevant groundwater zone is less than or equal to 15 percent of mean annual land surface recharge.</p> <p>(iii) a confined aquifer where the total volume of water allocated from the relevant groundwater zone is between 25 and 75 percent of aquifer throughflow; (iv) a riparian, terrace, confined or, fractured rock aquifer, or a source outside of the groundwater zones identified on Groundwater Map 1 of Appendix D, where the rate of take is greater than 2 litres per second, except as provided for in Rule 23(e); or</p> <p>(v) a source outside of the groundwater zones identified on Groundwater Map 1 of Appendix D, or a fractured rock aquifer, where the total volume of water applied for is between 25 and 50 percent of the rainfall recharge over the relevant land area where the water is to be used.</p>	<p>The applicant’s proposal is to abstract groundwater from the Makarewa lowland aquifer. The take is for more than 20 m<sup>3</sup>. Therefore, the activity is considered to be a <b>discretionary activity</b>.</p>



Rule	Assessment
<p><b>Rule 49 – Agricultural Effluent Ponds</b></p> <p>(a) The construction of any agricultural effluent pond is a restricted discretionary activity provided the following conditions are met:</p> <p>(i) a set of plans and specifications containing the information specified in Appendix A (Requirements for Agricultural Effluent Pond Construction and Design) is supplied to the Council describing the proposed design and construction process to avoid adverse effects on water quality;</p> <p>(ii) the agricultural effluent pond is not within 50 metres of any surface water body, artificial watercourse or coastal marine area; (iii) the agricultural effluent pond is not within 200 metres of any dwelling not on the same property, or 50 metres of the boundary of any other property;</p> <p>(iv) the agricultural effluent pond is not within 100 metres of any water abstraction point;</p>	<p>A <b>variation to consent</b> AUTH-20211143-03 from a 5,000 m<sup>3</sup> pond to larger 17,800 m<sup>3</sup> effluent storage pond has been provided as part of this application.</p> <p>A set of plans for the new effluent pond is attached to this application. All the information required in Appendix A of the RWP is attached.</p> <p>The pond will not be located within 50 m of a surface water body, 200 m from any dwelling, 50 m from property boundary or 100 m from any water abstraction point.</p>
<p><b>Rule 50 – Discharge of farm dairy effluent to land</b></p> <p>Part d of this rule applies as states below:</p> <p>The discharge of farm dairy effluent to land, that was not being lawfully undertaken as at 17 July 2010 (including an increase in the scale of an activity) in any of the following situations is a restricted discretionary activity:</p> <p>(i) low rate irrigation to soil/landscape categories A and B, and D and E as identified on Map 1 of Appendix N or determined by farm-scale soils mapping undertaken by a suitably qualified person; or</p> <p>(ii) low or high rate irrigation by slurry tanker to soil/landscape categories A, B, D and E as identified on Map 1 of Appendix N, or determined by farm-scale soils mapping undertaken by a suitably qualified person, does not exceed 5mm in depth.</p> <p>provided the following conditions are met:</p> <ol style="list-style-type: none"> <li>1. the discharge is not within 20 metres of any surface water body, artificial watercourse or the coastal marine area;</li> <li>2. the discharge is not within 200 metres of any place of assembly or dwelling not on the same property, or 20 metres of the boundary of any other property; and</li> <li>3. the discharge is not within 100 metres of any water abstraction point.</li> </ol> <p>(e) The discharge of farm dairy effluent to land outside of the soil/landscape categories identified on Map 1 of Appendix N or where, in the case of an application for the discharge of farm dairy effluent to land that was not being lawfully undertaken as at 17 July 2010 (including an increase in the scale of the activity, the Agricultural Effluent Rules - Page 6 Regional Water Plan for Southland Agricultural Effluent Rules discharge is within Natural State areas, or waterways which feed into Natural State catchments, or areas classified as Lowland/Coastal Lakes and Wetlands in Appendix D is a discretionary activity.</p>	<p>The discharge of effluent (from cows) was not being undertaken in 2010, however, there was discharge of effluent from a sheep milking operation.</p> <p>The application is via low-rate irrigation or slurry tanker to soil categories A and C. Applications via slurry tanker on the farm soils will not exceed 5 mm in depth.</p> <p>A discharge consent was granted for the spreading of effluent from the wintering barn onto part of the property. CGL proposes to spread effluent from two wintering barns and a dairy shed onto the whole farm (except Shark Teeth Hill Block). Therefore, a variation is required under this rule which would be a <b>discretionary activity</b>.</p> <p>It should be noted that this activity is consistent with a consent which has recently been granted.</p>



Rule	Assessment
<p>(f) The discharge of farm dairy effluent to land within soil/landscape category C as identified on Map 1 of Appendix N or determined by farm-scale soils mapping undertaken by a suitably qualified person using high rate irrigation is a non-complying activity.</p> <p>(g) Where the discharge of farm dairy effluent is to a mix of the soil/landscape categories identified on Map 1 of Appendix N, the status of the activity under Rules 50(a) to (e) will be determined by the soil/landscape category that has the highest consent test.</p> <p>(h) Where the discharge of farm dairy effluent to land will occur using both high rate and low rate irrigation, the status of the activity under Rules 50(a) to (d) will be based on the low rate irrigation</p>	

### 5.2.2 Proposed Southland Water and Land Plan (April 2018)

The proposed Southland Water and Land Plan has been through the plan hearing process and a decision version after recommendations from the hearing panel has been issued (April 2018). This proposed plan it is not yet operative and does not have full statutory weight; meaning it must be assessed alongside the Regional Water Plan for Southland (2010).

The plan is expected to be fully operative in 2022 subject to Environment Court appeals. An assessment of the rules applicable to the application have been made. The relevant rules are Rule 20, Rule 32B, Rule 35 and Rule 35A and Rule 54.

Rule	Assessment
<p><b>Rule 20 - Farming</b></p> <p>(a) The use of land for a farming activity is a permitted activity provided the following conditions are met:</p> <p>(i) the landholding is less than 20 hectares in area; or</p> <p>(ii) where the farming activity includes a dairy platform on the landholding, the following conditions are met:</p> <p>(1) the dairy platform has a maximum of 20 cows; or</p> <p>(2) the dairy platform had a dairy effluent discharge permit on 3 June 2016 that specified a maximum number of cows;</p> <p>(3) cow numbers have not increased beyond the maximum number specified in the dairy effluent discharge permit that existed on 3 June 2016;</p> <p>(4) from 1 May 2019, a Farm Environmental Management Plan for the landholding is prepared and implemented in accordance with Appendix N;</p> <p>(5) the landowner provides to the Southland Regional Council on request:</p> <p>(A) a written record of the good management practices, including any newly instigated good management practices in the preceding 12 months, occurring on the landholding; and</p>	<p>There are more than 20 cows being milked and CGL had no dairy effluent permit on 3 June 2016. Therefore, the application is a <b>discretionary activity</b>. No intensive winter grazing is proposed and land is less than 800 m above sea level.</p> <p>A Farm Management and Conversion Environment Plan will be in place which outlines good management practices and mitigations.</p>



Rule	Assessment
<p>(B) the Farm Environmental Management Plan prepared in accordance with Appendix N;            (6) the land area of the dairy platform is no greater than at 3 June 2016; and            (7) no part of the dairy platform is at an altitude greater than 800 metres above mean sea level;</p>	
<p><b>Rule 25 – Cultivation</b></p> <p>(a) The use of land for cultivation is a permitted activity provided the following conditions are met:            (i) cultivation does not take place within the bed of a lake, river (excluding ephemeral rivers where cultivation is permitted under Rule 20(aa)), artificial watercourse, modified watercourse or natural wetland;            (ii) cultivation does not take place within a distance of 5 metres from the outer edge of the bed of a lake, river (excluding ephemeral rivers where cultivation is permitted under Rule 20(aa)) artificial watercourse, modified watercourse or natural wetland;            (iii) cultivation does not occur at an altitude greater than 800 metres above mean sea level; and            (iv) cultivation does not occur on land with a slope greater than 20 degrees.</p> <p>(b) The use of land for cultivation that does not meet the setback distance of Rule 25(a)(ii) is a permitted activity provided the following conditions are met:            (i) cultivation does not take place within the bed of a lake, river (excluding ephemeral rivers where cultivation is permitted under Rule 20(aa)), artificial watercourse, modified watercourse or natural wetland and a distance of 3 metres from the outer edge of the bed;            (ii) cultivation does not take place more than once in any 5-year period;            (iii) cultivation is for the purpose of renewing or establishing pasture and is not undertaken to establish a crop used for intensive winter grazing, even as part of a pasture renewal cycle; and            (iv) cultivation does not occur at an altitude greater than 800 metres above mean sea level.</p> <p>(c) The use of land for cultivation, which does not meet one or more of the conditions of Rule 25(a) or Rule 25(b) is a restricted discretionary activity. The Southland Regional Council will restrict its discretion to the following matters:            1. potential adverse effects of discharges of sediment and other contaminants from the area being cultivated on water quality and biodiversity;            1a. mitigation measures for addressing adverse effects; and            3. monitoring and reporting undertaken to assess the effectiveness of any mitigation implemented.</p> <p>(d) Despite any other rule in this Plan, the use of land for cultivation at an altitude greater than 800 metres above mean sea level is a non-complying activity.</p>	<p>This is a <b>permitted activity</b> as it will meet all the conditions of this rule. No cultivation will be occurring within the bed of waterbodies. Cultivation will not take place within 5 metres of a bed of waterbodies. Altitude is not above 800 m. Cultivation will not take place on land with a slope greater than 20 degrees. The cultivation is not for the purpose of intensively grazing crops.</p>



Rule	Assessment
<p><b>Rule 32B – Construction, maintenance and use of new agricultural effluent storage facilities.</b></p> <p>(b) The use of land for the construction, maintenance and use of a new agricultural effluent storage facility, and any incidental discharge of agricultural effluent directly onto or into land from that facility which is within the normal operating parameters of a leak detection system, or the pond drop test criteria set out in Appendix P, which does not meet condition</p> <p>(i) or condition (ii) of Rule 32B(a) is a controlled activity provided the following conditions are met:</p> <p>(i) the design is certified by a Chartered Professional Engineer as being in accordance with IPENZ Practice Note 21: Farm Dairy Effluent Pond Design and Construction (2013) or IPENZ Practice Note 27: Dairy Farm Infrastructure (2013); and</p> <p>(ii) the application includes an operational management plan that addresses operational procedures, emergency response, monitoring and reporting requirements, the undertaking of pond drop tests, and installation of monitoring devices; and</p> <p>(iii) conditions (iii) to (vi) of Rule 32B(a).</p>	<p>A <b>variation to consent</b> AUTH-20211143-03 from a 5,000 m<sup>3</sup> pond to larger 17,800 m<sup>3</sup> effluent storage pond has been provided as part of this application.</p> <p>The proposed new storage pond is to be greater than 35 m<sup>3</sup> so is not a permitted activity under part (a).</p> <p>The proposed pond design will be certified by a chartered professional engineer with designed plans submitted to council before construction and use. The pond design will meet the required design standards. An operational effluent management plan is in place and conditions iii to iv of Rule 32Ba are meet. Pond design details are provided in Appendix D.</p>
<p><b>Rule 32 D – Existing Agricultural Effluent Storage Facilities</b></p> <p>(a) The use of land for the maintenance and use of an existing agricultural effluent storage facility that was authorised prior to Rule 32D taking legal effect, and any incidental discharge directly onto or into land from that storage facility which is, where relevant, within the normal operating parameters of a leak detection system or the pond drop test criteria set out in Appendix P, is a permitted activity provided the following conditions are met: (i) the construction of the existing agricultural effluent storage facility: (1) was authorised by a resource consent; or (2) was lawfully carried out without a resource consent; and (ii) where the construction of the existing agricultural effluent storage facility was lawfully carried out without resource consent, the landholding owner or their agent must provide information to the Southland Regional Council upon request, demonstrating that the existing agricultural effluent storage facility is either: (1) fully lined with an impermeable synthetic liner, or is of concrete construction, or is above ground level, and: (a) has a leak detection system that underlies the entire agricultural effluent storage facility which is inspected not less than monthly and there is no evidence of any leakage; and (b) is certified by a Suitably Qualified Person in accordance with Appendix P within the last 10 years as meeting the relevant pond drop test criteria in Appendix P; or (2) certified by a Suitably Qualified Person within the last three years as: (a) having no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility; and (b) meeting the relevant pond drop test criteria in Appendix P.</p>	<p>The use of the existing storage facilities is a <b>permitted activity</b> under part a of this rule.</p> <p>The construction of the existing ponds was lawfully carried out in 2008 and 2010. The ponds have been certified by a suitably qualified person and the ponds meet the drop test requirements of Appendix P of the PSLWP.</p>



Rule	Assessment
<p><b>Rule 35 – Discharge of Agricultural Effluent</b> Part C of Rule 35 applies to this consent.</p> <p>(c) Other than as provided for by Rules 32A, 32B and 32D, the discharge of agricultural effluent or water containing agricultural effluent onto or into land in circumstances where contaminants may enter water that does not meet one or more conditions of Rule 35(a) or conditions (i) or (ii) of Rule 35(b) is a discretionary activity, provided the following conditions are met:</p> <p>(i) the discharge is not within 20 metres of a lake, river, artificial watercourse, modified watercourse, natural wetland or the coastal marine area; and</p> <p>(ii) the discharge is not within 200 metres of any place of assembly or dwelling not on the same landholding, or 20 metres of the boundary of any other landholding; and</p> <p>(iii) the discharge is not within 100 metres of any authorised water abstraction point.</p>	<p>The application is not a permitted activity as it does not meet all parts of (a).</p> <p>Part b of this rule does not apply. The application is not for a renewal of an existing consent, instead it is a variation to an existing consent (AUTH-20211143-02).</p> <p>Part (c) therefore applies, and the application is a <b>discretionary activity</b>. The discharge will not be within 20 m of a surface watercourse, within 200 m of a neighbouring dwelling, 20 m to the boundary of another landholding or within 100 m of an authorised water abstraction point.</p>
<p><b>Rule 35A – Feed pads/lots</b></p> <p>(a) The use of land for a feed pad/lot is a permitted activity provided the following conditions are met:</p> <p>(i) if accommodating cattle or deer, each feed pad/lot services no more than 120 adult cattle, or 250 adult deer, or equivalent numbers of young stock at any one time;</p> <p>(ii) animals do not remain on the feed pad/lot for longer than three continuous months;</p> <p>(iii) the feed pad/lot is not located:</p> <p>(1) within 50 metres from the nearest sub-surface drain, lake, river (excluding ephemeral rivers), artificial watercourse, modified watercourse, natural wetland, or another feed pad/lot on the same landholding; or</p> <p>(2) within a microbial health protection zone of a drinking water supply site identified in Appendix J, or where no such zone is identified, then within 250 metres of the abstraction point of a drinking water supply site identified in Appendix J; or</p> <p>(3) within 200 metres of a place of general assembly or dwelling not located on the same landholding, or</p> <p>(4) within 20 metres of the boundary of any other landholding; or</p> <p>(5) within a critical source area;</p> <p>(iv) the feed pad/lot is constructed with:</p> <p>(1) a sealed and impermeable base and any liquid animal effluent or stormwater containing animal effluent discharging from the feed pad/lot is collected in a sealed animal effluent storage system authorised under Rule 32B or Rule 32D; or</p> <p>(2) a minimum depth of 500 millimetres of wood-based material (bark, sawdust or chip) across the base of the feed pad/lot; and</p> <p>(v) any material scraped from the feed pad/lot, including solid animal effluent, is collected and if applied to land is applied in accordance with Rule 38; and</p>	<p>Consent AUTH-20211143-04 has been granted to house up to 456 cows. However, the applicants intend to milk up to 640 cows and house up to 200 cows over winter from Capil Grove Farm as they want to avoid cows on pasture in winter and during adverse weather conditions due to soil structure damage. This requires a new wintering barn to be constructed. As a result, the new barn will be housing more than 120 adult cattle. Cows will also be in the barns longer than three consecutive months depending on the weather.</p> <p>The barns will not be located within those mentioned in conditions 1, 2, 3, 4 or 5.</p> <p>The new barn will be constructed with a sealed and impermeable base, with effluent collected in a storage effluent pond applied for as part of this consent.</p> <p>The overland flow of stormwater or surface runoff from surrounding land will be prevented from entering the new wintering barn.</p> <p>This activity is therefore considered <b>discretionary</b> under this Rule.</p>



Rule	Assessment
<p>(vi) the overland flow of stormwater or surface runoff from surrounding land is prevented from entering the feed pad/lot.</p> <p>(b) The use of land for a feed pad/lot that does not meet one or more of the conditions of Rule 35A(a) is a discretionary activity.</p>	
<p><b>Rule 38 – Animal and vegetative waste</b></p> <p>(a) The discharge of solid animal waste (excluding any discharge directly from an animal to land), sludge or vegetative material containing animal excrement or vegetative material, including from a high intensity farming process, feed pad/lot or wintering barn or industrial or trade process, into or onto land, or into or onto land in circumstances where a contaminant may enter water is a permitted activity provided the following conditions are met:</p> <p>(i) the material does not contain any hazardous substance or hazardous waste; and</p> <p>(ii) the material does not include any waste from a human effluent treatment process; and</p> <p>(iii) the maximum loading rate of nitrogen onto any land area does not exceed 150 kilograms of nitrogen per hectare per year; and</p> <p>(iv) the material is not discharged:</p> <p>(1) onto the same area of land more frequently than once every two months; or</p> <p>(2) onto land where solid animal waste, or vegetative material containing animal excrement or vegetative material from a previous application is still visible on the land surface; or</p> <p>(3) onto land when the soil moisture exceeds field capacity or when soil temperatures are below 5 degrees in winter and autumn or 7 degrees in spring; or</p> <p>(4) within 20 metres of the landholding boundary, a bore used for water abstraction, the bed of a lake, river, artificial watercourse, modified watercourse, natural wetland or the coastal marine area; or</p> <p>(5) with an average depth of material of greater than 10 millimetres on the land surface</p>	<p>This rule is mentioned but not required as this can be incorporated into the effluent discharge rule, with all effluent sources assumed to form either liquid or slurry and consent is applied for all forms of slurry and liquid effluent and from all sources. Application would be permitted under this rule as meets all parts.</p>
<p><b>Rule 54 – Take and Use of Groundwater</b></p> <p>(a) The take and use of groundwater is a permitted activity provided the following conditions are met:</p> <p>(i) the volume and rate of abstraction does not exceed:</p> <p>(1) a maximum of 86 cubic metres per day per landholding; and</p> <p>(2) a maximum rate of 5 litres per second; and</p> <p>(3) the point of abstraction is not within 50 metres of an existing lawfully established groundwater take;</p> <p>(ii) the maximum volume of take allowed under this rule and Rule 49(a) are not added together. A maximum of 86 cubic metres of groundwater and surface water combined per landholding per day, inclusive of any water taken pursuant to section 14(3)(b) of the RMA, is allowed;</p> <p>(iii) the following details are supplied to the Southland Regional Council upon request (if applicable):</p>	<p>The take is for less than 86 m<sup>3</sup> and the rate of take is for less than 5 L/s. A water meter will record the take and the relevant information as per (iii) will be provided to Southland Regional Council on request. Therefore the activity is <b>considered permitted</b> under Rule 54(a).</p>



Rule	Assessment
<p>(1) farming type; and            (2) stocking rate; and            (3) point of abstraction; and            (4) what the water is used for; and            (5) the maximum rate of take; and            (iv) where the volume of the take exceeds 20,000 litres per day, a water meter capable of recording the rate of take and the daily volume of take must be used. Water take data must be recorded daily and provided to the Southland Regional Council on request. The accuracy of the water meter must be verified every 12 months.</p>	

### 5.2.3 Regional Effluent Land Application Plan 1998

The Regional Effluent Land Application Plan applies to all discharges of effluent and sludge onto or into land in the region. It became operative in 1998. This plan is currently under review and it is proposed to integrate the Land Application Plan into the Land and Water Plan in the future. However, the rules relating to discharges remain operative, and therefore the rules in the Regional Effluent Land Application Plan are still applicable. Rule 5.4.6 applies to the proposed activity.

Rule	Assessment
<p><b>Sludges – Rule 5.3.1</b>            The discharge of sludge onto or into land from individual foul water drainage systems or agricultural effluent treatment systems are permitted activities, provided that the following criteria are met:</p> <ul style="list-style-type: none"> <li>a. the sludge is discharged onto the same property as it was generated. If the sludge is not discharged onto the same property, then the property which receives that discharge may not accept more than one sludge discharge application during a 12 month period; and</li> <li>b. there is no discharge of sludge directly to water, including groundwater, or the coastal marine area by:               <ul style="list-style-type: none"> <li>i. tile drainage</li> <li>ii. overland flow</li> <li>iii. pipes, or storm water drains</li> <li>iv. artificial free drainage areas; and</li> </ul> </li> <li>c. the rate of discharge does not result in any runoff; and</li> <li>d. the maximum depth of sludge application is 7 mm; and</li> <li>e. the minimum return period for discharging any other sludge or effluent onto or into the site is 28days; and</li> <li>f. the discharge is not within:               <ul style="list-style-type: none"> <li>i. 20 metres of any water or wetland listed in Appendix F, excluding groundwater;</li> <li>ii. 100 metres from any potable water abstraction point;</li> <li>iii. 20 metres of any property boundary;</li> <li>iv. 100 metres of any residential dwelling other than residential dwellings on the property; and</li> </ul> </li> <li>g. the effluent discharge system is operated so that there is no odour or spray drift nuisance beyond the boundary of the property.</li> </ul>	<p>The application to land of sludge from the effluent system is a <b>permitted activity</b> as will meet all the conditions of this rule.</p>





Rule	Assessment
<p><b>Part 5.4 Agricultural Effluent</b></p> <p><b>Rule 5.4.6</b> - The discharge of agricultural effluent onto or into land, other than provided for in Rules 5.4.1-5.4.5 is a discretionary activity.</p>	<p>Rule 5.4.1 does not apply as effluent is from a wintering barn that will service more than 100 adult cattle. Rule 5.4.2 does not apply as discharge is not from vegetable or bulb washing. Rule 5.4.3 does not apply as application is not from stationary agricultural dips, mobile sheep dips and spray dips. Rule 5.4.4 was revoked and Rule 5.4.5 now relates to piggery effluent only due to Rule 50 and 51 of Regional Water Plan for southland becoming operative. A consent to discharge dairy effluent has already been granted (AUTH-20211143-02). However, it did not include the other properties. Therefore, a variation is required under Rule 5.4.6 and is considered a <b>discretionary activity</b>.</p>

### 5.2.4 National Environment Standards for Freshwater (NES-F 2020)

In 2020 the government released the new National Environment Standards for Freshwater (NES-F). This new national standard includes sections that are relevant to farming activities, so the NES-F 2020 is assessed below. The rule relevant to this application is Rule 10 and 19.

	Standards	Assessment
<p><b>9</b></p>	<p><b>Feedlots and other stockholding areas:</b> Permitted Activities</p> <p>The use of land on a farm for holding cattle in a feedlot is a permitted activity if it complies with the condition.</p> <p>(2) The following discharge of a contaminant is a permitted activity if it complies with the condition:</p> <p>(a) the discharge is associated with the use of land on a farm for holding cattle in a feedlot; and</p> <p>(b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.</p> <p><i>Condition</i></p> <p>(3) The condition is that 90% or more of the cattle held in the feedlot must—</p> <p>(a) be no more than 4 months old; or</p> <p>(b) weigh no more than 120 kg.</p>	<p><b>Not Relevant</b> – The cattle in the wintering barn will be older than 4 months old and weigh more than 120 kg.</p>
<p><b>10</b></p>	<p><b>Feedlots and other stockholding activities</b> Discretionary activities</p> <p>The use of land on a farm for holding cattle in a feedlot is a discretionary activity if it (a) does not comply with the condition in regulation 9(3); but</p>	<p>The proposed activity does not comply with condition 9(3) above but the current and new wintering barn does/will meet the requirements of condition 3.</p> <p>Therefore the proposed activity is <b>discretionary</b>.</p>



	<b>Standards</b>	<b>Assessment</b>
	<p>(b) complies with the conditions in subclause (3) of this regulation.</p> <p>(2) The following discharge of a contaminant is a discretionary activity if it does not comply with the condition in regulation 9(3) but complies with the conditions in subclause (3) of this regulation:</p> <p>(a) the discharge is associated with the use of land on a farm for holding cattle in a feedlot; and</p> <p>(b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.</p> <p><i>Conditions</i></p> <p>(3) The conditions are that—</p> <p>(a) the base area of the feedlot must be sealed to a minimum permeability standard of 10<sup>-9</sup> m/s; and</p> <p>(b) effluent expelled in the feedlot must be collected, stored, and disposed of in accordance with a rule in a regional or district plan, or a resource consent; and</p> <p>(c) the feedlot must be at least 50 m away from any water body, any water abstraction bore, any drain, and the coastal marine area.</p>	
<b>11</b>	<p><b>Feedlots:</b> Non-complying activities</p> <p>(1) The use of land on a farm for holding cattle in a feedlot is a non-complying activity if it does not comply with—</p> <p>(a) the condition in <u>regulation 9(3)</u>; and</p> <p>(b) any condition in <u>regulation 10(3)</u>.</p> <p>(2) The following discharge of a contaminant is a non-complying activity if it does not comply with the condition in <u>regulation 9(3)</u> and any condition in <u>regulation 10(3)</u>:</p> <p>(a) the discharge is associated with the use of land on a farm for holding cattle in a feedlot; and</p> <p>(b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.</p>	<p><b>Not relevant</b> – The wintering barns comply with the above conditions in Rule 10.</p>
<b>12</b>	<p><b>Stockholding areas other than feedlots:</b> Permitted activities – stockholding areas for small and young cattle</p>	<p><b>Not Relevant</b> – no relevant facilities, wintering barn is associated with provisions above.</p>
<b>13</b>	<p><b>Stockholding areas other than feedlots:</b> Permitted activities – stockholding areas for larger and older cattle</p>	<p><b>Not Relevant</b></p>



	<b>Standards</b>	<b>Assessment</b>
<b>14</b>	<b>Stockholding areas other than feedlots:</b> Discretionary activities – stockholding areas for larger and older cattle	<b>Not Relevant</b>
<b>15</b>	<b>Agricultural Intensification</b> Application of this subpart (1) Except as provided in subclause (2), this subpart applies to— (a) farms; and (b) for the purposes of regulations 16 and 17, other landholdings in which land used for plantation forestry is being converted to pastoral land use. (2) This subpart does not apply to a farm or other landholding if the relevant regional council has publicly notified the amendments required by section 55(2B) of the Act to give effect to the National Policy Statement for Freshwater Management. (3) In subclause (2), publicly notified the amendments means that the proposed policy statement or plan containing the amendments has been publicly notified in accordance with clause 5 of Schedule 1 of the Act.	<b>Not Relevant</b> – There will be no intensification as there will be no wintering crops grazed on the property.  Further, while it could be considered the conversion to dairy farming is intensification, the impacts particularly as measured by nutrient losses are less than the previous land uses.
<b>16</b>	<b>Conversions of plantation forestry to pastoral land use:</b> Permitted activities	<b>Not Relevant</b> – Application is not associated with conversion from plantation forestry.
<b>17</b>	<b>Conversions of plantation forestry to pastoral land use:</b> Discretionary activities	<b>Not Relevant</b>
<b>18</b>	<b>Conversions of land on farm to dairy farm land:</b> Permitted activities (1) The conversion of land on a farm to dairy farm land is a permitted activity if it complies with the applicable condition. (2) The following discharge of a contaminant is a permitted activity if it complies with the applicable condition: (a) the discharge is associated with the conversion of land on a farm to dairy farm land; and (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water. Condition (3) If the farm included dairy farm land at the close of 2 September 2020, the condition is that, at all times, the area of the farm that is dairy farm land must be no greater than— (a) the area of dairy farm land at the close of 2 September 2020; plus (b) 10 ha. (4) In any other case, the condition is that, at all times, the area of the farm that is dairy farm land must be no greater than 10 ha.	The conversion of sheep system to dairy cow milking is <b>not permitted</b> as the area contained no dairy farm land previous to this application, and the area intended to be used for dairy farming is greater than 10 ha.



	<b>Standards</b>	<b>Assessment</b>
<b>19</b>	<p><b>Conversions of land on farm to dairy farm land:</b> Discretionary activities (1) The conversion of land on a farm to dairy farm land is a discretionary activity if it does not comply with the applicable condition in regulation 18(3) or (4). (2) The following discharge of a contaminant is a discretionary activity if it does not comply with the applicable condition in regulation 18(3) or (4): (a) the discharge is associated with the conversion of land on a farm to dairy farm land; and (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water. (3) See regulation 24 (discretionary activities: conditions on granting resource consents).</p>	<p>The proposed activities are <b>discretionary</b> as it meets the criteria of 19.</p> <p>As noted above, the conversion to dairy farming has been developed in a way to mitigate intensification impacts, particularly nutrient losses. Future losses are less than the previous land uses.</p>
<b>20</b>	<p><b>Irrigation of dairy farm land:</b> Permitted activities</p>	<b>Not Relevant</b> – There will be no application of water to land.
<b>21</b>	<p><b>Irrigation of dairy farm land:</b> Discretionary activities</p>	<b>Not Relevant</b> – as above.
<b>22</b>	<p><b>Use of land as dairy support land:</b> Permitted Activities</p>	<b>Not Relevant</b> – Not a consent for dairy support. The 200 Capil Grove Farm cows will not be grazing the land and will only be housed in the barn.
<b>23</b>	<p><b>Use of land as dairy support land:</b> Discretionary Activities</p>	<b>Not Relevant</b> – as above
<b>24</b>	<p><b>Resource Consents for discretionary activities</b> Conditions on granting resource consents (1) A resource consent for an activity that is a discretionary activity under this subpart may be granted only if the consent authority is satisfied that granting the consent will not result in an increase in— (a) contaminant loads in the catchment, compared with the loads as at the close of 2 September 2020; or (b) concentrations of contaminants in freshwater or other receiving environments (including the coastal marine area and geothermal water), compared with the concentrations as at the close of 2 September 2020. Term of resource consent (2) A resource consent granted for the discretionary activity must be for a term that ends before 1 January 2031.</p>	<p>Overseer modelling shows that the contaminant load on farm will be below that for nitrogen and similar for phosphorus from the previous systems that occurred on the property (including that which was occurring in 2020). Therefore, there will be no extra load on the catchment. Application is for a 10-year consent that expires January 2031 in line with this regulation.</p>
<b>26</b>	<p><b>Intensive winter grazing:</b> Permitted activities</p>	<b>Not Relevant</b> – No intensive winter grazing is proposed on this property.



	<b>Standards</b>	<b>Assessment</b>
	<p>(1) The use of land on a farm for intensive winter grazing is a permitted activity if it complies with the applicable condition or conditions.</p> <p>(2) The following discharge of a contaminant is a permitted activity if it complies with the applicable condition or conditions:</p> <p>(a) the discharge is associated with the use of land on a farm for intensive winter grazing; and</p> <p>(b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.</p>	
<b>27</b>	<p><b>Intensive Winter Grazing</b> Restricted Discretionary Activity</p> <p>(1) The use of land on a farm for intensive winter grazing is a restricted discretionary activity if the use does not comply with the applicable condition, or any of the applicable conditions, in regulation 26(3) or (4).</p> <p>(2) The following discharge of a contaminant is a restricted discretionary activity if it does not comply with the applicable condition, or any of the applicable conditions, in regulation 26(3) or (4):</p> <p>(a) the discharge is associated with the use of land on a farm for intensive winter grazing; and</p> <p>(b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.</p> <p>(3) But see regulation 29 (permitted activities and restricted discretionary activities: temporary further conditions).</p> <p><b>Matters to which discretion is restricted</b></p> <p>(4) The discretion of a consent authority is restricted to the following matters:</p> <p>(a) the adverse effects of the activity on ecosystems, freshwater, and water bodies:</p> <p>(b) the adverse effects of the activity on the water that affect the ability of people to come into contact with the water safely:</p> <p>(c) the adverse effects of the activity on Māori cultural values:</p> <p>(d) the susceptibility of the land to erosion, and the extent to which the activity may exacerbate or accelerate losses of sediment and other contaminants to water:</p>	<b>Not Relevant</b> – Application is not for intensive winter grazing.
<b>28</b>	<b>When regulations 29 and 30 do not apply</b>	<b>Not relevant</b>
<b>29</b>	<p>Permitted Activities and restricted discretionary activities: temporary further conditions</p> <p>(1) To be a permitted activity, an activity described in regulation 26(1) or (2) must also comply with the conditions in subclause (3) of this regulation (in</p>	<p>No intensive winter grazing is proposed. Intensive winter grazing of sheep in the previous milking farm system and dairy support on the Tuffin and Hancox Block has occurred in the past.</p>



	<b>Standards</b>	<b>Assessment</b>
	<p>addition to the applicable condition, or applicable conditions, in regulation 26(3) or (4)).</p> <p>(2) To be a restricted discretionary activity, an activity described in regulation 27(1) or (2) must comply with the conditions in subclause (3) of this regulation.</p> <p><i>Further conditions</i></p> <p>(3) The conditions are that—</p> <p>(a) land on the farm must have been used for intensive winter grazing in the reference period; and</p> <p>(b) at all times, the area of the farm that is used for intensive winter grazing must be no greater than the maximum area of the farm that was used for intensive winter grazing in the reference period.</p> <p>(4) To avoid doubt, the activity must comply with the conditions in subclause (3) of this regulation even if the maximum area used in the reference period was less than the applicable area under regulation 26(4)(a).</p> <p>Enforcement officer may require information</p> <p>(5) A person undertaking a permitted activity under regulation 26 must provide any information reasonably required by a regional council enforcement officer for the purpose of monitoring compliance with the conditions in subclause (3) of this regulation.</p>	
<b>30</b>	<b>Intensive Winter Grazing</b> Discretionary Activities	<b>Not relevant</b>
<b>33</b>	<p><b>Application of synthetic nitrogen fertilizer to pastoral land:</b></p> <p>Permitted activities</p> <p>(1) The following discharge of synthetic nitrogen fertiliser is a permitted activity if it complies with the condition:</p> <p>(a) the discharge is for the purpose of applying nitrogen to land in pastoral land use; and</p> <p>(b) the discharge is into the air, or into or onto land, including in circumstances that may result in the synthetic nitrogen fertiliser (or any other contaminant emanating as a result of natural processes from the fertiliser) entering water</p> <p><b>Condition</b></p> <p>(2) The condition is that the application of nitrogen, as a component of the synthetic nitrogen fertiliser, to the land in pastoral land use in a contiguous landholding must not exceed the nitrogen cap.</p>	<p><b>Yes – Permitted</b></p> <p>The farm will apply synthetic nitrogen fertiliser to land in pastoral land use and will not exceed the nitrogen cap of 190 kg N/ha, averaged across the landholding and to land that is not used to grow forage crops.</p>
<b>34</b>	<p><b>Application of synthetic nitrogen fertilizer to pastoral land:</b></p> <p>Non-complying activities</p>	<p>Nitrogen fertiliser application on this farm will be a permitted activity under standard 33.</p>



	<b>Standards</b>	<b>Assessment</b>
<b>35</b>	<b>Application of synthetic nitrogen fertilizer to pastoral land:</b> Compliance with regional rules	<b>Not relevant</b>
<b>36</b>	<p><b>Operating dairy farm: monitoring and information required</b></p> <p>A person who is responsible for operating a contiguous landholding that includes any dairy farm land must provide to the relevant regional council, no later than 31 July of each year, the following information relating to the previous 12-month period ending on 30 June of that year:</p> <p>(a) the area of land in pastoral land use in the contiguous landholding and, within that land, the areas of the following (all in hectares):</p> <p>(i) the land used to grow annual forage crops:</p> <p>(ii) the other land:</p> <p>(b) the area of land in other uses in the contiguous landholding (in hectares):</p> <p>(c) the receipts for the synthetic nitrogen fertiliser purchased for the contiguous landholding:</p> <p>(d) the types of synthetic nitrogen fertiliser applied to the contiguous landholding and, for each type, the percentage of the nitrogen component by weight:</p> <p>(e) the rate at which each type of synthetic nitrogen fertiliser was applied (in kg/ha/year)—</p> <p>(i) to the land in pastoral land use in the contiguous landholding and, within that land, to—</p> <p>(A) the land used to grow annual forage crops:</p> <p>(B) the other land:</p> <p>(ii) to the land in other uses in the contiguous landholding:</p> <p>(f) the dates on which the synthetic nitrogen fertiliser was applied.</p>	The proposed activities will comply with the monitoring and information required under this rule.



### 5.3 Consents Required

As summarised in Table 5.1 below, the following resource consents are required under the Regional Water Plan for Southland, 2010 (RWPS), The Regional Effluent Land Application Plan, The Proposed Southland Water and Land Plan, 2018 (pSWLP) and The National Environment Standards for Freshwater

**Table 5.1: Activity status and applicable rules.**

Consent	Plan	Rule	Activity Status
Discharge Permit to discharge agricultural effluent to land	RWPS	50 (d)	Discretionary
	PSWLP	35 (c)	Discretionary
	RELAP	5.4.6	Discretionary
Permit for Farming	PSWLP	20e	Discretionary
Water Permit to take and use groundwater for dairy shed wash down and stock drinking	RWPS	23 (d)ii	Discretionary
Variation for the use of land for the maintenance and use of agricultural effluent storage facilities	PSWLP	32B	Controlled
Conversion to dairy	RWPS	17 (a)	Discretionary
	NES-F 2020	19	Discretionary
Variation for the use of the wintering barns for upto 956 cows.	PSWLP	35A	Discretionary
	NES-F 2020	10	Discretionary

Overall, the proposal is a **discretionary activity**.

### 5.4 Consents not required.

In accordance with Schedule 4 of the RMA, an application must describe and demonstrate compliance with any permitted activity that is part of the proposal to which the application relates.

**Table 5.1 Activities for which consent is not required.**

Activity	Compliance with the relevant permitted rules of the RWPS and PSWLP
Incidental discharges from farming (Rule 24 PSWLP)	No incidental discharges proposed that would contravene section 15(1) of the RMA
Fertiliser (Rule 10 RWPS, Rule 14 PSWLP and NPS_F 2020 Rule 33)	All practicable measures will be taken to minimise fertiliser drift beyond the target areas. Fertiliser will be applied to selected areas of the farms in accordance with nutrient budget recommendations, and soil tests to avoid excess leaching of nutrients to groundwater. Fertiliser will be applied when a soil water deficit exists, and all waterways will have buffers with stock excluded.  New fertiliser rules have come in at a national level restricting fertiliser use to 190 kg/ha to all pastoral land,





	as averaged over that land; and to each hectare of that land that is not used to grow annual forage crops. Fertiliser use will be to permitted activity rules.
Silage storage and silage leachate (Rule 51 of the RWPS, and Rules 40 & 41 of the PSWLP.)	All silage storage facilities will be located away from sensitive receiving environments, in accordance with permitted rule setbacks and no direct discharge of silage leachate to any waterbody is proposed.
Animal and vegetative waste (Rule 38 of the PSWLP)	For completeness, all effluent sources have been assumed to form either liquid or slurry and consent is applied for to discharge all forms of slurry and liquid effluent, and all sources of effluent (wintering barns and weeping walls) to the proposed effluent disposal land area.
Cleanfill, Farm Landfills and Offal Holes (Rules 53, 54 & 55 of the RWPS, and Rules 42 & 43 of the PSWLP)	All permitted activity requirements can be met and sensitive areas can be easily avoided when undertaking these associated activities.
Drainage of Land (Rule 9 RWPS & Rule 13 PSWLP)	It is not anticipated that any discharge from subsurface drains would result in a conspicuous change to the colour and/or clarity of the receiving waters at a distance of 20m from the point of discharge. The proposed good management practices will significantly reduce the likelihood of any contaminants reaching the subsurface drains.
Winter grazing (Rule 20 of PSWLP and NES-FM 26-27)	No intensive wintering grazing is proposed, stock will be housed in wintering barn. Any intensive winter grazing on the property will be in line with permitted activity requirements. If mobs are greater than 120 cows or more than 15 % of land on the property is to be in winter crops, then resource consent will be applied for. An adverse weather grazing management plan is in place.
Cultivation (Rule 25 of the PSWLP)	No cultivation will be occurring within the bed of waterbodies. Cultivation will not take place within 5 metres of a bed of waterbodies. Altitude is not above 800 m. Cultivation will not take place on land with a slope greater than 20 degrees. The cultivation is not for the purpose of intensively grazing crops.
Stock exclusion from waterbodies (Rule 70 PSWLP)	All waterbodies are fenced, and crossings are bridged over. Bed disturbance from stock is thus avoided and dairy cattle on the dairy platform are excluded from waterbodies.
Natural Wetlands (NES-FM Subpart 1)	No land disturbance, clearance, drainage or earthworks changes to any wetlands is proposed.
Groundwater Abstraction (Rule 54 - PSWLP)	The take is for less than 86 m <sup>3</sup> and less than 5 l/s.



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## 6 ASSESSMENT OF ENVIRONMENTAL EFFECTS

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### 6.1 Discharge of Farm Dairy Effluent to Land and the Use of a Wintering Barn

#### 6.1.1 Sensitivity of Receiving Environment and Summary of Effects

Plants, the soil, groundwater, surface water and the air are all potentially sensitive to the proposed application of FDE and the effects of grazing dairy cattle. However, in this location, due to the management of grazing (such as the use of wintering barns) and FDE application (the rates described in the manner of the proposed application), the adverse effects on each of these receiving environments are expected to be less than minor.

The plants and soil are expected to benefit in terms of productivity from the application of FDE; at the proposed application rate there is not expected to be significant sensitivity in terms of adverse effects. The use of the wintering barns will help to protect soil from damage during sensitive periods. The proposed pond also allows for storage and management of FDE application in times when the soil is saturated, or temperatures are cold (even outside of winter months where weather is unpredictable like May and September).

Shallow groundwater could be sensitive to the proposed activity. However, the low proposed rate of FDE applications and use of the wintering barns are not expected to cause adverse effects on this environment. The proposed farming system has a much lower nitrogen loss overall, and so this proposed activity could be considered a benefit to groundwater.

Surface water should always be considered sensitive to nearby discharges and land uses. However, a combination of the low annual FDE application rate and the exclusion of application within buffer margins from waterways make it unlikely that any FDE would reach surface water bodies. No ponding, run-off, or soil through-flow will occur. Exclusion of stock from waterways will limit the flow of animal derived contaminants reaching surface water.

Sensitivity to odour depends on both the degree of acceptability of the smell involved, and the proximity of people potentially offended by it. A 200 m buffer from neighbouring residences is proposed from any FDE application area.

Accordingly, it is concluded that there is comparatively low sensitivity of the receiving environment to the effects of the proposed activity.

As noted elsewhere, this application is for the continuation of an existing activity of animal grazing and effluent application, one in which there is no monitoring that suggests adverse effects.

#### 6.1.2 Effects on Soil and Plants

##### FDE application

The effects on soil from the FDE applications at the nominated application depths will be to moisten the soil. Provided the FDE is applied at the nominated application depth, there should be no ponding, run-off, through-flow, or any other adverse effect. The proposed application depths are appropriate for the soil and the FDE soil risk classifications of the soil.

The effects of nitrogen and phosphorus on soil and plants will similarly be to enhance soil fertility and encourage plant growth. Provided the hydraulic application rate does not exceed the proposed low rate application, and that there is no run-off, ponding or through-flow as a result,



then the nutrients will be retained in the soil until consumed by the pasture or crops as appropriate. The application rate of N and P will not be out of line with commercial fertiliser application rates.

Pathogens in the FDE are not expected to persist or lead to any environmental or public health or livestock difficulty in their interaction with plants and soil. Any residual pathogens are expected to be neutralised by exposure to UV light during application or desiccated and consumed by soil microbes within the receiving soil. Retention of the FDE on the application site, with no ponding, run-off or through-flow, are further expected to ensure that any persistent pathogens do not migrate from the site.

The effects of the proposed FDE application on soil and plants are expected to be less than minor.

### **Grazing**

Winter grazing cattle on pasture increases the likelihood of damaging soils and plants via pugging. This occurs when cattle trample wet soil in high density – which is apparent during grazing of winter crops and break feeding. On Farm 444 cows will be housed in the wintering barns during periods of heavy rainfall or when soils are wet to avoid this from happening. Allowing up to 200 cows from Capil Grove Farm also reduces pasture damage on that property.

The grazing system for the proposed dairy farm will be no different to the recently consented dairy support system. There will be no winter grazing of crops which further mitigates the chances of pugging. As a consequence, plants will remain healthy and soil structure will not be damaged.

The stocking rate on the property is low (around 1.9 cows per hectare) which will reduce any damage to pastures during the other months of the year from over stocking.

It is therefore considered that the effects of the proposed grazing of dairy cattle on soil and plants are expected to be less than minor.

#### **6.1.3 Overseer Nutrient Modelling**

OVERSEER® nutrient budgets have been prepared to show the amount of nitrogen and phosphorus discharged from the future proposed scenario compared to what was previously occurring on the farm.

The OVERSEER® budget modelling is an accurate description of the previous farming operations and consequent N & P losses beneath the root zone and leaving the property.

The main block of the farm previously had to consent to milk up to 3,000 ewes. In the baseline model, approximately 2,000 ewes have been modelled on farm, along with their associated lambs, rams and 750 replacement hoggets. It had 17 ha of swedes grown as a rotational fodder crop. The Tuffin Block was previously running 400 dairy grazing replacement and 30 mixed age beef cattle on the property. It had 18 ha of swedes grown as a rotational fodder crop. Harwood Farm Located at 346 Springhills-Tussock Creek Road was operated as a sheep block with 200 ewes and 200 lambs. Hancox Farm Located at 394 Springhills-Tussock Creek Road, Springhills, Southland operated as a dairy support grazing 400 winter cows on 16 ha of kale and grazing calves on pasture until the second winter. The available pasture was then cut for baleage and fed out on the kale crop.

In the baseline modelled scenario, it shows pasture production at approximately 17 t DM/ha/yr. This is not what would realistically happen on the property but is a down fall of the model.



The proposed scenario has been modelled with 640 cows on the farm all year around, with the cows in the wintering barns over winter. An additional 200 cows from the Capil Grove Farm property, which the applicants also own, is proposed to reduce soil damage on that property in the winter. Barley grain will be grown on the property over spring and early autumn and then stored for feeding in the milking shed. In the model, there is no option to have the barley grain taken from storage so it has been modelled as purchased. This will overestimate the amount of nitrogen lost to the system as it is accounting for nitrogen being brought on to the property via the modelled imported grain.

Table 6.1 presents the summary of overall N and P losses beneath the root zone for 640 cows.

**Table 6.1: Summary of modelled nutrient losses to water from Stage 0 (Baseline) and Stage 4 (640 cows milked and housing the 200 Capil Grove Cows in the barn.)**

<b>Nutrient Losses</b>	<b>Stage 0 - (Baseline Farming operations)</b>	<b>Stage 4 - (Proposed Farm System once sheep lease has finished)</b>	<b>Difference</b>
N Loss from the root zone	34 kg N/ha/year 11,629 kg N/year	28 kg N/ha/yr 9,620 kg N/ha/yr	-6 kg N/ha/year -2,009 kg N/year
P Loss from the root zone	1.9 kg P/year 634 kg P/ha/year	1.9 kg P/ha/year 648 kg P/year	+/- 0 kg P/ha/year + 14 kg P/year

The modelling shows that the future proposed scenario has a significant reduction in nitrogen loss and no significant change in phosphorus. It is expected that the phosphorus difference is within the error margin of modelling. This indicates that use of the wintering barns for dairy cows during winter, as well as not having winter crops and growing barley grain instead, has positive effects to the existing combined operations. Consequently, there will be an overall reduction in nutrients being lost to the receiving environment.

The Overseer model for Stage 3 has also been generated which includes a representation of the nutrient losses when 50 ha of land is leased as a sheep system for the first four years. The lease block has been modelled to carry 500 breeding ewes, 6 rams and associated lambs. To be conservative the model also has 8 ha of crop rotating on the lease block which is carried out by the lessee. On the balance of the area, up to 505 cows would be milked but only after the new pond is installed. The wintering barns would also be able to carry the 200 Capil Grove Farm cows over winter. Prior to the new pond installation, the property would carry dairy support cows, which was consented in June 2021 (AUTH-20211143-01) and these cows would then stay on the property and be milked. Once the 4-year lease period has finished, the cow numbers are proposed to increase to 640 as there will be no sheep on the property.

#### **6.1.4 Effects on Groundwater**

##### **FDE application**

The application of FDE to the flat land of 444 Farm has the potential to lead to a through-flow of water (i.e. additional drainage), and therefore a proportion of the dissolved nutrients could potentially be transported from the surface into the underlying groundwater with this additional drainage.

However, the application of FDE only when there is sufficient soil moisture deficit will ensure minimal movement of contaminants into the groundwater. This effect is expected to be within the range of effects arising from such activities as commercial fertiliser application, which do not need resource consent i.e. meet a permitted baseline test.



There is a buffer of 200 m from the neighbouring dwelling and the proposed groundwater abstraction point. The abstraction point is also fenced to stop cattle entering the area. Therefore, the proposed activity is not expected to lead to any effect on groundwater that can be detected in any bore.

While there will be shallow groundwater movement through the soil from rainfall and towards surface streams, the groundwater is unlikely to be affected from application of FDE for the following reasons: the application timing is matched to periods when there is a soil moisture deficit and there is a low proposed nutrient loading of up to 150 kg N/ha/y. At this low N loading contamination of groundwater is not expected to occur. There is sufficient area for effluent application to ensure this low N load from FDE applications is maintained.

An artificial drainage network is present across the farm and increases the risk of preferential drainage. Application of FDE will only occur when there is a soil moisture deficit, therefore drainage through to the artificial network to groundwater will be avoided, or at worst, minimised.

### **Grazing**

CGL will not be intensely grazing or winter grazing pastures during high rainfall or when soils are wet. Cows will be held in the barn during these periods. This mitigates the potential of damaging the soil structure via pugging. Soil structure will be undisturbed, allowing for good air movement and root penetration through the soil. Nutrients will be held in the soil instead of being leached into groundwater. It is expected that these management practices will be of benefit to the groundwater.

## **6.1.5 Effects on Surface Water**

### **FDE application**

Surface water could potentially be contaminated either by direct application of FDE into a water body, by surface run-off during or after FDE application, or by the inclusion of contaminated groundwater.

It is proposed to exclude all water bodies and their margins from FDE application, and to ensure that application only occurs in a manner that does not result in ponding or run-off. The 20 m separation required by the Regional Effluent Plan is expected to ensure that there will be no movement of FDE into any surface water bodies. It is not expected that the low application depths, application when soil conditions are appropriate, combined with the total nitrogen application rate not exceeding 150 kg N/ha/y, at a distance not less than 20 m from any watercourse, will lead to any significant transport of contaminants via overland flow or through shallow groundwater to any surface water.

Based on the considerations identified above, it is expected that the effects of the FDE application to land on surface water will be less than minor.

### **Grazing**

Exclusion of stock from waterways is one of the best ways to reduce sediment and nutrients entering water. On Farm 444, all waterways are fenced off to exclude stock from water.

Intensive grazing of pasture or crops during high rainfall and cold temperatures can damage the soil structure via pugging. A poor soil structure as a result of pugging reduces air and water movement through the soil profile. The pores of the soil become compacted and as a result restrict the movement of nutrients and nutrient holding capacity of the soil. In this situation, nutrients (and sediment) are likely to runoff the paddock into nearby surface water. CGL is



mitigating the chances of this occurring by using the winter barns as described above, thereby reducing grazing pressure on the property during winter. It is expected that the effects of grazing on surface water is less than minor.

### 6.1.6 Effects on the Air

There is potential for FDE to emit odours as it is discharged. However, typical FDE operations have shown that while the odour is distinctive, it is not objectionable.

Any aerosol generated from the proposed activities will be minor, immediately local, and short-lived.

The intensity of the odour is expected to be moderate at the point of discharge, reducing to less than minor at a distance exceeding 200 m. The duration of the odour (and its persistence) is expected to be limited by the rapid breakdown of the FDE in contact with soil, pasture and air. The reality is odour will only be detectable during application which will last for several minutes and be infrequent.

The character of the odour may be described as rural and organic, rather than as putrid or offensive. The locality of the discharge will be a minimum of 200 m from the nearest dwelling not on the property.

The effects of the proposed FDE application to land on the air are expected to be less than minor.

### 6.1.7 Summary of FDE Mitigation

The potential adverse effects of FDE application to land are mitigated by several factors, as follows:

- Low hydraulic application rate - so that the risk of ponding, run-off and through-flow is reduced.
- Low nitrogen loading rate - by limiting the **total nitrogen** application rate to not greater than 150 kg total N/ha/y, the soluble or plant available nitrogen loading should be fully used as it becomes available. This aspect of the activity will align other FDE applications within the Southland region.
- Locality - the property is an operative dairy support farm with activities almost identical to that of a dairy farm. It is well away from most of the people or facilities that could potentially be sensitive to some aspect of the proposed activity.
- On-site separation distances - the property is sufficiently large to be able to accommodate all the proposed FDE application activity at distances from property boundaries, watercourses, and residential dwellings that will meet specific plan requirements and avoid potential nuisance effects.
- Low pressure applications - this will largely avoid the generation of aerosols during application, reducing the likelihood of spray drift or odour problems
- There is an Emergency Contingency Plan in place as outlined in Section 8 and the effluent management plan.



### **6.1.8 Summary of Proposed FDE Monitoring**

It is proposed that the following monitoring measures be applied to the proposed activity, in order to maintain responsive awareness to any potential adverse environmental effect that may arise in practice.

- Yearly FDE analyses - concentrations of nitrogen species in the FDE will be monitored to ensure that field application rates can be adjusted if and as necessary to keep nitrogen application rate within consented limit.
- Application site record keeping - a log is to be maintained of volumes of FDE, dates, and paddocks to which FDE is applied.
- Complaints log - a register will be maintained by the consent holder of any complaints received relating to the proposed activity, including details of the complainant and the measures taken to resolve the complaint.
- Groundwater and Surface Water analyses - groundwater or surface water samples are **not** proposed to be taken and analysed on a scheduled basis. The low application of nutrient in comparison to the catchment land use and fertiliser applications means it is unlikely that useful conclusions will be able to be drawn from any water quality monitoring program which specifically relate to the proposed activities.

### **6.1.9 Summary of Grazing Mitigation**

The potential adverse effects of grazing of dairy cattle are mitigated by several factors, as follows:

- Wintering barns – Cows will be housed during periods of heavy rainfall or when soils are wet.
- Intensive grazing – No intensive grazing of pasture or crops will occur to mitigate damage to soil structure.
- Supplements – Silage is fed in the wintering barns, not directly on the ground.
- Cow numbers – The property has a low stocking rate to reduce the amount of trample that is occurring on the pasture.
- Fencing – All waterways on the property are fenced to exclude stock.

### **6.1.10 Summary of Proposed Grazing Monitoring**

It is proposed that the following monitoring measures be applied to the proposed activity, in order to maintain responsive awareness to any potential adverse environmental effect that may arise in practice.

- Soil moisture monitoring – Soils moisture is monitored via reference soil moisture monitoring data from Environment Southland monitoring sites or via on-farm soil moisture monitoring.
- Grazing record keeping – Stock numbers and location of animals will be recorded.
- Monitoring of fences – Check fencing regularly for any damage and fix as soon as possible to avoid risk of cattle entering waterways.



### **6.1.11 Mitigation**

A Farm Management and Conversion Environment Plan which includes a wet weather and winter grazing plan will be in place. The Farm Management and Conversion Environment Plan can be found attached to this application (Appendix B). Mitigations set out in that plan mean the overall nitrogen losses over the combined properties are expected to drop by around 2,000 kg N/year as modelled by OVERSEER® which will be of a benefit to the surrounding environment.

## **6.2 Water Take Activity**

The applicant proposes to abstract 2 L/s and 85.8 m<sup>3</sup>/day from a spring on the Harwood Block to service stock drinking water and dairy shed needs. Below is an assessment of environmental effects of the proposed activity which is considered discretionary under Rule 23 of the SRWP and permitted under Rule 54 of the PSLWP.

### **6.2.1 Groundwater Allocation and Management Zones**

The proposed groundwater take is abstracted from the Makarewa Groundwater Management Zone. This zone has a current allocation limit of 62.67 million m<sup>3</sup> per year. It is understood that the zone is currently 4.6% allocated. The proposal represents approximately 0.1 % of the groundwater zone's current allocation limit and would therefore not result in exceeding the allocation limit should the proposal be granted. This proposal therefore represents a less than minor effect on the Makarewa Groundwater Management Zone and its management.

### **6.2.2 Hydraulic Connection to Surface Water Bodies**

There is an ephemeral drain near the ground water abstraction point, however the only time where this would flow is during a heavy rainfall/ flood event. The application is for no more than 2 L/s, therefore hydraulic connection to any surface water body need not be considered as per Policy 29 of the SRWP and the allocation should therefore be accounted for solely in the Groundwater Management Zone. The application will not impact on stream flows, river minimum flows or allocation levels. The application will also have no effect on wetland or lake levels in the region.

### **6.2.3 Well Interference Effects**

This application is for no more than 86 m<sup>3</sup>, therefore well interference effects are expected to be less than minor as per outlined in the Groundwater Provisions of the Proposed Southland Water and Land Plan (Land Water People, 2017). This states *"Experience (and improved knowledge of the hydrogeological environment) has shown the groundwater takes of less than 86 m<sup>3</sup>/day are unlikely to result in more than minor effects on the environment". "The only situation where such abstraction could potentially be an issue is where pumping bores are in close proximity (e.g. immediately adjacent across a property boundary) in areas where aquifer permeability is low. This issue is addressed by performance standards on the proposed rule that require a minimum separation distance of 50 m metres between adjacent permitted groundwater takes"*.

The closest bore in use is 900 m from the take. Therefore, the expected well interference effects are considered less than minor.

### **6.2.4 Seasonal Recovery Triggers**

The aquifer that the applicant's bore is proposed to draw water from is not considered confined and therefore trigger values need not be established.





### **6.2.5 Efficiency of Use and Reasonable Water Use Assessment**

The volumes calculated for stock drinking and dairy shed use are based on industry values. A total of 120 L/cow/day has been sought, based on the recommendation of 70 L/cow/day for stock water and 50 L/cow/day for shed use using Dairy NZ's Farm Dairy Effluent Design Standards and Code of Practice (DairyNZ, 2015). It should be noted that these are maximum usage rates and for large periods of the year the actual usage will be considerably less; which corresponds to reduced effects from that predicted. Drinking water requirements will be highest in winter when the Capil Grove Farm cows are on the property. However, winter is a period when cow drinking requirements are likely to be much less as they are under cover, evapotranspiration and temperatures are lower and the Capil Grove Farm cows will be dry (not milking); which is why a value of 45 L/cow has been used. This is expected to be an efficient and reasonable use of water, and a reflection of actual water usage as needed by cows i.e. there is limited opportunity for wastage.

### **6.2.6 Effects on Groundwater Quality**

The proposed take does not present an adverse effect on groundwater quality. The taking of water itself will not contaminate the groundwater supply. As discussed above there is very little impact of this take on other surrounding bores in terms of drawdown effect. The volumes taken are appropriate for the groundwater and will not cause a degrading in the groundwater quality that would cause groundwater quality to exceed plan limits.

## **6.3 Positive Effects**

### **6.3.1 Proposed Activities**

The key positive effects of the proposed activities are the protection of soil from damage and enhanced agricultural production. Effluent is being applied evenly and when conditions are suitable, reducing nutrient losses from the farm. The proposed discharge is to land, which is a preferred discharge method in the Proposed Water and Land Plan.

The use of the wintering barns, and not just in winter, will provide an opportunity for stock to be taken off paddocks when soil conditions are not suitable, reducing the potential for soil damage and an increased potential for nutrient, pathogen and sediment loss. The wintering barns will also be of benefit to the Capil Grove Farm property, allowing some of the cows to be housed when they would otherwise be on pasture.

### **6.3.2 Value of Investment**

Under Section 104 (2A) of the Resource Management Act, the consenting authority must have regard to the value of the investment of an existing consent holder.

In this instance, this consent is valuable as it enables operation of the farm to occur. In terms of the beneficial reuse of nutrients the average cow produces about \$25 worth of nutrients annually as FDE. The FDE on this farm from 640 cows is therefore worth about \$16,000 in nutrients.

In terms of animal feeding, housing, milking system and effluent management, the investment is several million dollars.

## **6.4 Summary of Effects**

As described above, the proposed application of FDE to land and the grazing of dairy cattle potentially have effects on soil and plants, groundwater, surface water and air. However, the proposed farming system and FDE application regime, and the mitigation of potential effects,



means potential negative effects will be less than minor. Further, the proposed activity will have the beneficial effects of productivity enhancement and environmental protection.



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## 7 STATUTORY PROVISIONS

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### 7.1 Introduction

The provisions of the Resource Management Act 1991, 1998, National Policy Statements, National Environment Standards, Southland Regional Policy Statement, The Proposed Southland Water and Land Plan, Regional Water Plan for Southland, Regional Effluent Land Application Plan and Iwi Management Plan are discussed in this section. This includes an assessment of the activity against the relevant objectives and policies of these provisions.

### 7.2 Resource Management Act 1991

The purpose of the Resource Management Act (RMA) 1991 is to promote the sustainable management of natural and physical resources. Generally, activities that affect air, water or land must be authorised either by a rule in a regional plan or by the granting of a resource consent. The relevant sections to this proposal are identified below.

Section 9 (2) of the RMA Restrictions on use of land states that:

"No person may use land in a manner that contravenes a regional rule unless the use —  
(a) is expressly allowed by a resource consent; or  
(b) is an activity allowed by section 20A."

Section 14(3) of the RMA Restrictions relating to water states that:

"A person is not prohibited from taking, using, damming, or diverting any water, heat, or energy if —  
(a) the taking, using, damming, or diverting is expressly allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent."

Section 15(1) of the RMA Discharge of contaminants into environment states that:

"No person may discharge any—  
(a) *contaminant or water into water; or*  
(b) contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water —  
unless the discharge is especially allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region, or a resource consent."

The proposal under application here will comply with the requirements of section 9, 14 and 15 by virtue of being subject to a resource consent requirement.

### 7.3 National Policy Statements

#### 7.3.1 National Policy Statement for Freshwater Management 2017

National Policy Statements (NPS) enable the government to prescribe objectives and policies for matters of national significance which are relevant to achieving the sustainable management purpose of the RMA. The National Policy Statement for Freshwater Management (NPS-FM, 2017) is relevant to this proposal.



The NPS-FM sets out objectives and policies that direct Regional Councils to manage water in an integrated and sustainable way, while providing for economic growth within set water quantity and quality limits. This is achieved primarily through Regional Plan changes incorporating nationally consistent limits on water quality and values, nationally consistent consideration of matters when determining resource consent applications and monitoring of freshwater quality.

An assessment of the proposed activities against the objectives and policies of the NPS-FM 2017 has been completed below:

#### Water Quality

##### *Objective A1 To safeguard:*

- a) The life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
  - b) The health of people and communities, as affected by contact with fresh water;*
- In sustainably managing the use and development of land, and of discharges of contaminants.*

##### *Objective A2 The overall quality of fresh water within a freshwater management unit is maintained or improved while*

- a) Protecting the significant values of outstanding freshwater bodies*
- b) Protecting the significant values of wetlands; and*
- c) Improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.*

Objective A1 and A2 reflects the clear expectation that freshwater quality not be degraded, and at least maintained if not improved. The expected water quality effects of the proposal are very minor, and conditions to mitigate any perceived risk ensures that quality of fresh water will be maintained at a standard that is anticipated by the existing Water Plan and the Proposed Land and Water Plan.

##### *Objective A3 The quality of fresh water within a freshwater management unit is improved so it is suitable for primary contact more often, unless:*

- a) regional targets established under Policy A6(b) have been achieved; or*
- b) naturally occurring processes mean further improvement is not possible.*

##### *Objective A4 To enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing freshwater quality, within limits.*

It is anticipated that the reduction in nitrate loss arising from the application will be significant with an improvement from the previous farming system, as described in Section 6. The proposal will not in itself deteriorate the health of the rivers, streams, lakes and wetlands to a level or degree that would compromise their overall suitability for contact recreation.

The proposal will provide economic wellbeing, by allowing the successful operation of CGL's farming operation, which will bring money and provide employment opportunities to the wider community. These economic benefits can be achieved without impacting on freshwater quality.

Overall, it is intended that the proposal will meet the requirements of this NPS-FM 2017 by minimising any adverse effect on the environment, and in particular on freshwater quality and its associated ecosystems.



### 7.3.2 National Policy Statement for Freshwater Management 2020

The government announced a new National Policy Statement for Freshwater Management 2020 (NPS-FM, 2020) which will provide local authorities with updated direction on how they should manage freshwater under the Resource Management Act 1991.

The objective of this NPS is to ensure that natural and physical resources are managed in a way that prioritises:

- (a) first, the health and well-being of water bodies and freshwater ecosystems;
- (b) second, the health needs of people (such as drinking water)
- (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The proposal is consistent with the hierarchy of obligations because:

- 1) Firstly, the health and well-being of water bodies and freshwater ecosystems is considered. No additional nutrient loss load is being applied for and the farm nutrient loss will be operated at or below baseline from the previous farming system. Mitigation such as setbacks to waterbodies are proposed. Overall, there will be a less than minor effect on the health and wellbeing of waterbodies. Other environmental benefits are also gained such as the protection of soils, especially over winter through the use of the wintering barns.
- 2) Secondly, the proposal will not affect the health of people. The nutrient loss from the property is below baseline for nitrogen and at baseline for phosphorus and will not cause the water quality to become unsuitable for human health/recreation.
- 3) Lastly, it provides for the social, cultural and economic wellbeing. The proposal allows for increased income and supports jobs on the land. This flows onto to benefits for the wider southland community.

An assessment of the policies of the NPS-FM 2020 is provided below:

Policy	Assessment
1. Freshwater is managed in a way that gives effect to Te Mana o te Wai.	As discussed in AEE, the proposal will have less the minor effect on the water body and the water body will still be able to sustain the full range of environmental, social, cultural and economic values held by iwi and the community.
2. Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.	Māori values have been identified and assessed below in this application.
3. Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.	The effects on the receiving environment have been assessed in the AEE.
4. Freshwater is managed as part of New Zealand's integrated response to climate change.	Applying FDE will help protect the farm from climate change as it will provide liquid and nutrients to plants
5. Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.	The proposal will not cause a degradation of the water way and it's well-being will be maintained.



6. There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.	No loss of natural inland wetlands and their values will be caused as a result of this proposal.
7. The loss of river extent and values is avoided to the extent practicable.	No loss of river extent and values will be caused as a result of this proposal.
8. The significant values of outstanding water bodies are protected.	N/A – no outstanding water bodies will be impacted.
9. The habitats of indigenous freshwater species are protected.	Habitats of indigenous freshwater species will not be impacted by this proposal
10. The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.	Trout will not be impacted by this proposal and proposal is consistent with Policy 9
11. Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.	Water is taken for drinking water and dairy shed use which is required for the health and safety of the cows. Water will be used efficiently for these required activities.
12 The national target (as set out in Appendix 3) for water quality improvement is achieved.	The proposal will not compromise the national targets being achieved/maintained
13. The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.	N/A
14. Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.	Compliance with consent conditions and proposed nutrient load will be monitored
15 Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with this National Policy Statement.	Application will provide for the social, economic and cultural wellbeing.

The proposed change arising from the planned activities on the 444 Farm will be marginal and not in itself deteriorate the health of the rivers, streams, lakes and wetlands. Threatened species and mahinga kai will not be impacted by the proposed operation. The proposal is deemed to be in line with the policies and objectives of the National Policy Statement for Freshwater Management.

## 7.4 National Environmental Standards

National Environmental Standards (NES) are regulations that prescribe technical and non-technical standards, methods or other requirements for land use and subdivision, use of the coastal marine area and beds of lakes and rivers, water take and use, discharges, or noise. The relevant national standard that relates to this proposal is the National Environmental standard for Sources of drinking water (NES-DW) and the National Environmental Standard for Freshwater (NES-F).

### 7.4.1 National Environmental Standard for Sources of Drinking Water

The NES-DW requires regional authorities to ensure the effects on community water supply and sources are considered in decision on resource consents and regional plans.



The possible transfer of nitrates from the proposed activities to any drinking water source is minor. There are no community drinking water sites within reasonable distance of the application area. Proposed mitigations and good management practices such as buffer distances to waterways or any potable water bores and only applying FDE during correct soil conditions, as described in Section 4 ensure that this proposal will not adversely affect sources of drinking water in the Southland Region.

#### 7.4.2 National Environmental Standard for Freshwater

The National Environmental Standards for Freshwater (2020) regulates activities that pose risks to the health of freshwater and freshwater ecosystems. The relevant standards to this proposal have been identified in Section 5.

### 7.5 Southland Regional Policy Statement

The Southland Regional Policy Statement (RPS) became operative in October 2017. The RPS provides a framework for the manner in which Southland's natural and physical resources will be managed. It directs regional and district plans to address the cumulative effects of resource use and development. It considers the community's aspirations and the actions required to achieve success, while encouraging people to work together. It also recognises our connections to our environment by encompassing the Ngāi Tahu philosophy of "ki uta ki tai" – from the mountains to the sea.

The vision and principles of the SRPS are embodied in the Regional Water Plan, Land Application Plan and Iwi Management Plan, where they are specific to the management in those areas.

For instance, Objective WQUAL.2 of the SRPS requires that the life-supporting capacity of water and related ecosystems; and health of people and communities is safeguarded. Whilst water quality is maintained and improved to meet the reasonably foreseeable social, economic and cultural needs of future generations. This is provided for in Objective 4.12 and 4.1.3 of the Regional Effluent Land Application Plan.

The chapters and objectives in the SRPS that are considered to most closely relate to this proposal as discussed below, but this list is not exhaustive.

#### Chapter 3: Tangata Whenua Provisions

Objective TW.1	<i>The principles of the Treaty of Waitangi/Te Tiriti o Waitangi are taken into account in a systematic way through effective partnerships between tangata whenua and local authorities, which provide the capacity for tangata whenua to be fully involved in council decision-making processes.</i>
Objective TW.2	<i>All local authority resource management processes and decisions take into account iwi management plans.</i>
Objective TW.3	<i>Mauri and wairua are sustained or improved where degraded, and mahinga kai and customary resources are healthy, abundant and accessible to tangata whenua.</i>
Objective TW.4	<i>Wāhi tapu, wāhi taonga and sites of significance are appropriately managed and protected.</i>
Objective TW.5	<i>Māori are able to develop and use their land and resources and provide for their social, economic and cultural wellbeing, in a manner that is sustainable.</i>



Tangata Whenua have been considered in each of the Regional Plans. For example, Policy 4.2.8 of the Regional Effluent Land Application plan also states that tangata whenua concerns must be recognised and provided for in relation to the discharge of effluent and sludge onto or into land.

Buffer zones from waterways along with other proposed mitigations and good farm management practices will ensure that this proposal will not negatively impact the environment, allowing for the continued sustainment of mahinga kai and customary resources used by the tangata whenua.

#### Chapter 4: Water Quality: Part A

Objective WQUAL.1	<i>Water quality in the region: (a) safeguards the life-supporting capacity of water and related ecosystems; (b) safeguards the health of people and communities (c) is maintained, or improved in accordance with freshwater objectives formulated under the National Policy Statement for Freshwater Management 2014; (d) is managed to meet the reasonably foreseeable social, economic and cultural needs of future generations</i>
Objective WQUAL.2	<i>Halt the decline, and improve water quality in lowland water bodies and coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands in accordance with freshwater objectives formulated in accordance with the National Policy Statement for Freshwater Management 2014.</i>
Objective WQUAL.3	<i>Maintain the quality of water where it is in its natural state.</i>

As set out in Section 6 of this application, the potential adverse effects of the proposal on surface water quality have been assessed to be less than minor overall. Mitigation and management measures to prevent runoff and leaching from adversely affecting water quality and ecosystem health have been proposed. The quantity of water sought from this application is reasonable and within allocation limits. The water resource will be used efficiently. As a result, water quality will be maintained within and not exceed the limits set out in the Water Plan.

#### Chapter 5: Rural Land/Soils

Objective RURAL.1	<i>Achieve sustainable use of Southland's rural land resource, in respect of: (a) agriculture and primary sector activities; (b) subdivision, use and development activities; (c) earthworks and vegetation clearance activities; (d) the use of soil resources; (e) mineral extraction activities; and (f) on-site wastewater systems.</i>
Objective RURAL.2	<i>Safeguard the life-supporting capacity, mauri and health of soils in rural areas, and prevent or minimise soil erosion and sedimentation from land use soil disturbance.</i>

This proposal will contribute to protecting the health of the Region's soils, through ensuring that applications of FDE only occur during the appropriate soil conditions. The use of a wintering barns helps to protect the soils from damage during winter. An effluent and adverse weather grazing management plan will be in place to ensure soils are appropriately managed. Overall, the proposal looks to use land in a sustainable way the safeguards the life supporting capacity and health of soils.





In light of the discussion above and the alignment of the proposal with the relevant objectives and policies of the relevant Regional Plans, it is considered that the proposal is consistent with the SRPS.

## 7.6 The Proposed Southland Water and Land Plan

The Proposed Southland Water and Land Plan (PSWLP) is part way through a hearing process, and the decisions version has legal effect from April 2018. This plan is designed to be an amalgamation of the existing Regional Water Plan and Regional Effluent Land Application Plan.

An assessment of the proposal against all the objectives in the plan are given below in Table 7.1

**Table 7.1: Assessment of proposal against objectives of Southland Water and Land Plan.**

OBJECTIVE	ASSESSMENT
<b>Objective 1:</b> Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.	<b>YES:</b> Proposal will be carried out in a sustainable way, using good management practices and will not degrade the regions water (both groundwater and freshwater), land or coast.
<b>Objective 2:</b> Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.	<b>YES:</b> In this proposal both land and water are enabling primary production and the economic, social and cultural wellbeing of the region.
<b>Objective 3:</b> The mauri of waterbodies provide for te hauora o te tangata (health and mauri of the people), te hauora o te taiao (health and mauri of the environment) and te hauora o te wai (health and mauri of the waterbody).	<b>YES:</b> Low effluent application rates, applications tailored to soil type and incorporation of buffers from surface water ways mean that proposed discharge will not impact on the health and mauri of waterbodies, people or the environment. Good management practices for the use of wintering barn will ensure that waterbodies are not impacted. Overall, the life supporting capacity of the regions land and water resources are maintained or improved.
<b>Objective 4:</b> Tangata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems.	<b>YES:</b> The proposal is to be carried out with low application rates, applications tailored to soil type and incorporation of buffers from surface water and good farm management practices mean that proposal is therefore, not impacting on Tangata whenua values in relation to the management of freshwater and associated ecosystems.
<b>Objective 5:</b> Ngāi Tahu have access to and sustainable customary use of, both commercial and non-commercial, mahinga kai resources, nohoanga, mātaītai and taiāpure.	<b>YES:</b> The proposal will not in any way impact on the access to or sustainable use by Ngai Tahu of mahinga kai resources, nohoanga, mātaītai and taiāpure.
<b>Objective 6:</b> There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by: (a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; (b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.	<b>YES:</b> As demonstrated in the AEE, application scheduling using soil moisture status combined with low application rates, incorporation of buffers from surface water ways, appropriate take volumes and good farm management practices mean that proposal will not result in a reduction in overall freshwater quality.



OBJECTIVE	ASSESSMENT
<p><b>Objective 7:</b> Any further over-allocation of freshwater (water quality and quantity) is avoided and any existing over-allocation is phased out in accordance with freshwater objectives, freshwater quality limits and timeframes established under Freshwater Management Unit processes.</p>	<p><b>YES:</b> Water take is within appropriate allocation and is a reasonable amount that will be used efficiently.</p>
<p><b>Objective 8:</b> (a) The quality of groundwater that meets both the Drinking Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and (b) The quality of groundwater that does not meet Objective 8(a) because of the effects of land use or discharge activities is progressively improved so that: (1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking Water Standards for New Zealand 2005 (revised 2008); and (2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes</p>	<p><b>YES:</b> As demonstrated in the AEE, soil type selection and application scheduling with low application rates, buffers from groundwater abstraction points and overall good farm management practices being carried out mean that proposal will not result in an adverse change in groundwater below the application area that is more than minor.</p>
<p><b>Objective 9:</b> The quantity of water in surface waterbodies is managed so that aquatic ecosystem health, life supporting capacity, outstanding natural features and landscapes and natural character are safeguarded.</p>	<p><b>NA:</b> No water will be taken from surface waterbodies as part of this proposal.</p>
<p><b>Objective 9A:</b> Surface water is sustainably managed to support the reasonable needs of people and communities to provide for their social, economic and cultural wellbeing.</p>	<p><b>YES:</b> Surface water will not be impacted by this proposal. Appropriate buffers to surface water from associated activities will be maintained</p>
<p><b>Objective 9B:</b> The effective development, operation, maintenance and upgrading of Southland’s regionally significant, nationally significant and critical infrastructure is enabled.</p>	<p><b>NA:</b> Will enable the operations of a farm which contributes to an industry that has regional significance.</p>
<p><b>Objective 10:</b> The national importance of existing hydro-electric generation schemes, including the Manapouri hydro-electric generation scheme in the Waiau catchment, is provided for, recognised in any resulting flow and level regime, and their structures are considered as part of the existing environment.</p>	<p><b>NA:</b> This proposal will not impact on existing hydroelectric generation schemes.</p>
<p><b>Objective 11:</b> The amount of water abstracted is shown to be reasonable for its intended use and water is allocated and used efficiently.</p>	<p><b>YES:</b> The amount of water to be abstracted as a result of this proposal is shown to be reasonable for its intended use and is allocated and use efficiently</p>
<p><b>Objective 12:</b> Groundwater quantity is sustainably managed, including safeguarding the life-supporting capacity, ecosystem processes and indigenous species of surface</p>	<p><b>YES:</b> The amount of water to be abstracted as a result of this proposal is shown to be reasonable and within allocation, ensuring that groundwater is sustainably managed. The life supporting capacity of groundwater will be maintained.</p>



OBJECTIVE	ASSESSMENT
water bodies where their flow is, at least in part, derived from groundwater.	
<b>Objective 13:</b> Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.	<b>YES:</b> Economic benefit to CGL and the district. Direct and Indirect regional employment opportunities e.g. contractors, factory workers, famers. Beneficial reuse of nutrients.
<b>Objective 13A:</b> The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities or discharges to land.	<b>YES:</b> Soil will not be degraded by this proposal. No intensive farming will be taking place on the property. The winter barns allow for cows to be off the pasture when conditions are poor. A larger effluent storage pond allows for the storage of effluent for long periods of time so FDE does not have to be discharged in unsuitable conditions.
<b>Objective 13B :</b> The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.	<b>YES:</b> As demonstrated in the AEE at the proposed application rates, the proposal does not have significant or cumulative adverse effects on human health.
<b>Objective 14:</b> The range and diversity of indigenous ecosystem types and habitats within rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.	<b>YES:</b> Indigenous ecosystems and habitats are maintained as this proposal incorporates low nutrient application rates and separation distances to surface water features, therefore having less than minor impact on these areas.
<b>Objective 15:</b> Taonga species, as set out in Appendix M, and related habitats, are recognized and provided for.	<b>YES:</b> The proposal incorporates low nutrient application rates and separation distances to surface water features, therefore no Taonga species or habitats will be affected by this proposal.
<b>Objective 16:</b> Public access to, and along, river (excluding ephemeral rivers) and lake beds is maintained and enhanced, except in circumstances where public health and safety or significant indigenous biodiversity values are at risk.	<b>YES:</b> This application will not restrict public access to any river or lake bed. Application will not occur within set buffer distances of any surface waterways.
<b>Objective 17:</b> The natural character values of wetlands, rivers and lakes and their margins, including channel and bed form, rapids, seasonably variable flows and natural habitats, are protected from inappropriate use and development.	<b>YES:</b> The proposal is for activities only be on existing agricultural land. Natural character areas will not be degraded.
<b>Objective 18:</b> All activities operate in accordance with "good management practice" or better to optimize efficient resource use, safeguard the life supporting capacity of the region's land and soils, and maintain or improve the quality and quantity of the region's water resources.	<b>YES:</b> Good management practices will be carried out in all aspects of the proposed farming system, including fertiliser use as per the Code of Practice for Nutrient Management. An Effluent Management Plan and Farm Management and Conversion Environment Plan have been completed and outlined to ensure good management is taking place in all aspects of the property. Therefore, the proposed activity will not degrade water resources or life supporting capacity of regions land and soils.

The supporting policies within the plan outline how these objectives may be met. The policies relevant to this proposal include Policies 1-3 which are Ngai Tahu policies to ensure that the papatipu Rūnanga can participate in freshwater management, that iwi management plans are taken into consideration and that taonga species are not adversely affected.



The Iwi Management Plan has been considered (Section 7.9). The application of FDE to only existing pasture and crop land will avoid impacting on listed taonga species.

Other relevant policies within the Proposed Plan, are Policies 4 – 12 which are related to the Physiographic zones from the Southland region. The relevant zones for this proposal are Gleyed, Bedrock/Hill Country and Peat Wetlands.

Policy 6 Gleyed, Bedrock/Hill Country and Lignite Marine Terraces states that:

*In the Gleyed, Bedrock/Hill Country and Lignite-Marine Terraces physiographic zone, avoid, remedy, or mitigate adverse effects on water quality from contaminants, by:*

- 1. requiring implementation of good management practices to manage adverse effects on water quality from contaminants transported via artificial drainage, and overland flow where relevant; and*
- 2. having particular regard to adverse effects on water quality from contaminants transported via artificial drainage, and overland flow where relevant when assessing resource consent applications and preparing or considering Farm Environmental Management Plans.*

Policy 11 Peat Wetlands states that:

*In the Peat Wetlands physiographic zone, avoid, remedy, or mitigate adverse effects on water quality from contaminants, by: 1. requiring implementation of good management practices to manage adverse effects on water quality from contaminants transported via artificial drainage, deep drainage, and lateral drainage; 2. having particular regard to adverse effects on water quality from contaminants transported via artificial drainage, deep drainage, and lateral drainage when assessing resource consent applications and preparing or considering Farm Environmental Management Plans; and 3. decision makers generally not granting resource consents for additional dairy farming of cows or additional intensive winter grazing where contaminant losses will increase as a result of the proposed activity*

Physiographic zone details have been considered in the low rate application methodology along with timing of the application to take into consideration the key transport pathways for contaminants for each physiographic zone above. Good management practice during applications of FDE to land will be carried out and a Farm Management and Conversion Environment Plan has been prepared. An Overseer model for this property in the conversion from sheep milking, beef and dairy support grazing to dairy cow milking has been completed. Good management practices have been put in place and shown that there will be no adverse environmental impacts and a significant decrease in the loss of nitrogen from this proposed conversion. The wintering barns helps capture effluent in times where weather conditions are poor and disperse effluent when plant growth requirements are higher – reducing the amount of fertiliser required to be brought onto the property and also recycling nutrients that would otherwise be leached or runoff. Furthermore, no intensive winter grazing is taking place.

The PSWLP contains a relevant policy section on Water Quality. As assessment of the proposal against the relevant policies in relation to water quality is provided in Table 7.2 below.



**Table 7.2: Assessment of proposal against water quality policies of Southland Water and Land Plan.**

<b>POLICY</b>	<b>ASSESSMENT</b>
<p><b>Policy 13 – Management of land use activities and discharges</b>            1. Recognise that the use and development of Southland’s land and water resources, including for primary production, enables people and communities to provide for their social, economic and cultural wellbeing.            2. Manage land use activities and discharges (point source and non-point source) to enable the achievement of Policies 15A, 15B and 15C.</p>	<p><b>YES:</b> This proposal adds to uses of Southland’s land and water resources that are in a productive way to provide for the region’s wellbeing. Policies 15A – C either do not apply or are met by the proposal.</p>
<p><b>Policy 14 – Preference for discharges to land</b>            Prefer discharges of contaminants to land over discharges of contaminants to water, unless adverse effects associated with a discharge to land are greater than a discharge to water. Particular regard shall be given to any adverse effects on cultural values associated with a discharge to water.</p>	<p><b>YES:</b> This proposal is for the preferred discharge to land rather than a discharge to water, which would be an alternative option. Adverse effects on cultural values are avoided as the discharge is not to water.</p>
<p><b>Policy 15A – Maintain water quality where standards are met</b>            Where existing water quality meets the Appendix E Water Quality Standards or bed sediments meet the Appendix C ANZECC sediment guidelines, maintain water quality including by:            1. avoiding, remedying or mitigating the adverse effects of new discharges, so that beyond the zone of reasonable mixing, those standards or sediment guidelines will continue to be met; and            2. requiring any application for replacement of an expiring discharge permit to demonstrate how the adverse effects of the discharge are avoided, remedied or mitigated, so that beyond the zone of reasonable mixing those standards or sediment guidelines will continue to be met</p>	<p><b>YES:</b> The discharge in this proposal is not directly into waterways. There will be no mixing with receiving waters. Water quality and sediment in waterbodies will not be affected and proposal will not impact the ability of a waterbody to continue to meet guidelines.</p>
<p><b>Policy 15B – Improve water quality where standards are not met</b>            Where existing water quality does not meet the Appendix E Water Quality Standards or bed sediments do not meet the Appendix C ANZECC sediment guidelines, improve water quality including by:            1. avoiding where practicable and otherwise remedying or mitigating any adverse effects of new discharges on water quality or sediment quality that would exacerbate the exceedance of those standards or sediment guidelines beyond the zone of reasonable mixing; and            2. requiring any application for replacement of an expiring discharge permit to demonstrate how and by when adverse effects will be avoided where practicable and otherwise remedied or mitigated, so that beyond the zone of reasonable mixing water quality will be improved to assist with meeting those standards or sediment guidelines</p>	<p><b>YES:</b> As the discharge to water is avoided by the proposed conditions, water quality measures in Appendix E do not apply. There are also no adverse effects from this proposal that would exacerbate the exceedance of those measures.            The proposal is not the replacement of an expiring discharge consent.</p>



POLICY	ASSESSMENT
<p><b>Policy 15C – Maintaining and improving water quality after FMU processes</b>            Following the establishment of freshwater objectives and limits under Freshwater Management Unit processes, and including through implementation of non-regulatory methods, improve water quality where it is degraded to the point where freshwater objectives are not being met and otherwise maintain water quality where freshwater objectives are being met</p>	<p><b>YES:</b> The proposal will improve water quality due to the low N loading rates and mitigations will help to maintain water quality in areas where freshwater objectives are not being met after the FMU process.</p>
<p><b>Policy 16 – Farming activities that affect water quality</b>            1. Minimising the adverse environmental effects (including on the quality of water in lakes, rivers, artificial watercourses, modified watercourses, wetlands, tidal estuaries and salt marshes, and groundwater) from farming activities by:            (a) discouraging the establishment of new dairy farming of cows or new intensive winter grazing activities in close proximity to Regionally Significant Wetlands and Sensitive Waterbodies identified in Appendix A; and            (b) ensuring that, in the interim period prior to the development of freshwater objectives under Freshwater Management Unit processes, applications to establish new, or further intensify existing, dairy farming of cows or intensive winter grazing activities will generally not be granted where:            (i) the adverse effects, including cumulatively, on the quality of groundwater, or water in lakes, rivers, artificial watercourses, modified watercourses, wetlands, tidal estuaries and salt marshes cannot be avoided or mitigated; or            (ii) existing water quality is already degraded to the point of being overallocated; or            (iii) water quality does not meet the Appendix E Water Quality Standards or bed sediments do not meet the Appendix C ANZECC sediment guidelines; and            (c) ensuring that, after the development of freshwater objectives under Freshwater Management Unit processes, applications to establish new, or further intensify existing, dairy farming of cows or intensive winter grazing activities:            (i) will generally not be granted where freshwater objectives are not being met; and            (ii) where freshwater objectives are being met, will generally not be granted unless the proposed activity (allowing for any offsetting effects) will maintain the overall quality of groundwater and water in lakes, rivers, artificial watercourses, modified watercourses, wetlands, tidal estuaries and salt marshes.            2. Requiring all farming activities, including existing activities, to:            (a) implement a Farm Environmental Management Plan, as set out in Appendix N; and            (b) actively manage sediment run-off risk from farming and hill country development by identifying</p>	<p><b>YES:</b> Adverse effects on the environment from this proposal are avoided when the proposed activities are performed in accordance with the proposed conditions.</p> <p>A farm environmental plan and effluent management plan will be maintained.</p> <p>The activity is not in close proximity to Regionally significant wetland or sensitive areas.</p> <p>Application methods and buffers are in place to avoid runoff to surface water bodies.</p>



POLICY	ASSESSMENT
<p>critical source areas and implementing practices including setbacks from waterbodies, sediment traps, limits on areas or duration of exposed soils and the prevention of stock entering the beds of surface waterbodies; and</p> <p>(c) manage collected and diffuse run-off and leaching of nutrients, microbial contaminants and sediment through the identification and management of critical source areas within individual properties.</p> <p>3. When considering a resource consent application for farming activities, consideration should be given to the following matters:</p> <p>(a) whether multiple farming activities (such as cultivation, riparian setbacks, and winter grazing) can be addressed in a single resource consent; and</p> <p>(b) granting a consent duration of at least 5 years.</p>	
<p><b>Policy 17 – Agricultural effluent management</b></p> <p>1. Avoid significant adverse effects on water quality, and avoid, remedy, or mitigate other adverse effects of the operation of, and discharges from, agricultural effluent management systems.</p> <p>2. Manage agricultural effluent systems and discharges from them by:</p> <p>(a) designing, constructing and locating systems appropriately and in accordance with best practice; and</p> <p>(b) maintaining and operating effluent systems in accordance with best practice guidelines; and</p> <p>(c) avoiding any surface run-off or overland flow, ponding or contamination of water, including via sub-surface drainage, resulting from the application of agricultural effluent to pasture; and</p> <p>(d) avoiding the discharge of untreated agricultural effluent to water.</p> <p>Note: Examples of best practice referred to in Policy 17(2)(a) for agricultural effluent include IPENZ Practice Note 21: Farm Dairy Effluent Pond Design and Construction and IPENZ Practice Note 27: Dairy Farm Infrastructure.</p> <p>Note: Examples of best practice guidelines referred to in Policy 17(2)(b) for agricultural effluent include DairyNZ's guidelines A Farmer's Guide to Managing Farm Dairy Effluent – A Good Practice Guide for Land Application Systems, 2015 and A Staff Guide to Operating Your Effluent Irrigation System, 2013.</p>	<p><b>YES:</b> Significant adverse effects on water quality are avoided. The effluent system is designed appropriately and in accordance with best practice guidelines. The low application systems, buffer distances, low total loading and other mitigation ensure that no run-off, overland flow or contamination of water will occur. No direct discharge of effluent to water will occur.</p>
<p><b>Policy 18 – Stock exclusion from waterbodies</b></p> <p>Reduce sedimentation and microbial contamination of water bodies and improve river (excluding ephemeral rivers) and riparian ecosystems and habitats by:</p> <p>1. requiring progressive exclusion of all stock, except sheep, from lakes, rivers (excluding ephemeral rivers), natural wetlands, artificial watercourses, and modified</p>	<p><b>Yes:</b> Stock are excluded from waterways. The farm has a Farm Management and Conversion Environment Plan.</p>



POLICY	ASSESSMENT
<p>watercourses on land with a slope of less than 15 degrees by 2030; and</p> <p>2a. requiring the management of sheep in critical source areas and in those catchments where E. coli levels could preclude contact recreation; and</p> <p>3. encouraging the establishment and enhancement of healthy vegetative cover in riparian areas, particularly through use of indigenous vegetation; and</p> <p>4. ensuring that stock access to lakes, rivers (excluding ephemeral rivers), natural wetlands, artificial watercourses and modified watercourses is managed in a manner that avoids significant adverse effects on water quality, bed and bank integrity and stability, mahinga kai, and river and riparian ecosystems and habitats.</p>	

Policies 20 – 25 relate to water quantity. Policies 26 - 38 in the PSWLP relate to any of the listed activities that could affect water quality and quantity. An assessment of the proposal against the relevant water quantity policies is provided in Table 7.3.

**Table 7.3: Assessment of proposal against water quality policies of Southland Water and Land Plan.**

POLICY	ASSESSMENT
<p><b>Policy 20 – Management of water resources</b> Manage the taking, abstraction, use, damming or diversion of surface water and groundwater so as to:</p> <p>1A. recognise that the use and development of Southland’s land and water resources, including for primary production, can have positive effects including enabling people and communities to provide for their social, economic and cultural wellbeing;</p> <p>1. avoid, remedy or mitigate adverse effects from the use and development of surface water resources on:</p> <p>(a) the quality and quantity of aquatic habitat, including the life supporting capacity and ecosystem health and processes of waterbodies;</p> <p>(b) natural character values, natural features, and amenity, aesthetic and landscape values;</p> <p>(c) areas of significant indigenous vegetation and significant habitats of indigenous fauna;</p> <p>(d) recreational values;</p> <p>(e) the spiritual and cultural values and beliefs of tangata whenua;</p> <p>(f) water quality, including temperature and oxygen content;</p> <p>(g) the reliability of supply for lawful existing surface water users, including those with existing, but not yet implemented, resource consents;</p> <p>(h) groundwater quality and quantity;</p> <p>(j) mātaimai, taiāpure and nohoanga;</p> <p>2. avoid, remedy or mitigate significant adverse effects from the use and development of groundwater resources on:</p> <p>(a) long-term aquifer storage volumes;</p>	<p><b>YES:</b> The proposal has positive effects and enables social, economic and cultural wellbeing. There is appropriate allocation, the take will not have a significant impact on surface and ground water and any potential adverse effects are mitigated. Water will be used efficiently, and volume is a reasonable for its intended use.</p>





POLICY	ASSESSMENT
<p>(b) the reliability of supply for lawful existing groundwater users, including those with existing, but not yet implemented, resource consents;</p> <p>(c) surface water flows and levels, particularly in spring-fed streams, natural wetlands, lakes, aquatic ecosystems and habitats (including life supporting capacity and ecosystem health and processes of waterbodies) and their natural character; and</p> <p>(d) water quality;</p> <p>3. ensure water is used efficiently and reasonably by requiring that the rate and volume of abstraction specified on water permits to take and use water are no more than reasonable for the intended end use following the criteria established in Appendix O and Appendix L.4.</p>	
<p><b>Policy 21 – Allocation of water</b> Manage the allocation of surface water and groundwater by:</p> <ol style="list-style-type: none"> <li>1. determining the primary allocation for confined aquifers not identified in Appendix L.5, following the methodology established in Appendix L.6;</li> <li>2. determining that a waterbody is fully allocated when the total volume of water allocated through current resource consents and permitted activities is equal to either:               <ol style="list-style-type: none"> <li>(a) the maximum amount that may be allocated under the rules of this Plan, or</li> <li>(b) the provisions of any water conservation order;</li> </ol> </li> <li>3. enabling secondary allocation of surface water and groundwater subject to appropriate surface water environmental flow regimes, minimum lake and wetland water levels, minimum groundwater level cutoffs or seasonal recovery triggers, to ensure:               <ol style="list-style-type: none"> <li>(a) long-term aquifer storage volumes are maintained; and</li> <li>(b) the reliability of supply for existing groundwater users (including those with existing resource consents for groundwater takes that have not yet been implemented) is not adversely affected;</li> </ol> </li> <li>4. when considering levels of abstraction, recognise the need to exclude takes for nonconsumptive uses that return the same amount (or more) water to the same aquifer or a hydraulically connected lake, river, modified watercourse or natural wetland.</li> </ol>	<p><b>YES:</b> It is understood that the groundwater zone is currently 4.6% allocated. The proposal represents approximately 0.1% of the groundwater zones current allocation limit and would therefore not result in exceeding the allocation limit should the proposal be granted.</p>
<p><b>Policy 22 – Management of the effects of groundwater and surface water use</b> Manage the effects of surface and groundwater abstractions by:</p> <ol style="list-style-type: none"> <li>1. avoiding allocating water to the extent that the effects on surface water flow would not safeguard the mauri of that waterway and mahinga kai, taonga species or the habitat of trout and salmon;</li> <li>2. ensuring interference effects are acceptable, in accordance with Appendix L.3;</li> <li>3. utilising the methodology established in Appendix L.2 to:</li> </ol>	<p><b>YES:</b> Proposed take will not negatively affect the mauri of waterways. Interference effects are expected to be less than minor.</p>



POLICY	ASSESSMENT
(a) manage the effects of consented groundwater abstractions on surface waterbodies; and (b) assess and manage the effects of consented groundwater abstractions in groundwater management zones other than those specified in Appendix L.5.	
<p><b>Policy 23 – Stream depletion effects</b>            Manage stream depletion effects resulting from groundwater takes which are classified as having a Riparian, Direct, High or Moderate hydraulic connection, as set out in Appendix L.2 Table L.2, to ensure the cumulative effect of those takes does not:</p> <ol style="list-style-type: none"> <li>1. exceed any relevant surface water allocation regime (including those established under any water conservation order) for groundwater takes classified as Riparian, Direct, High or Moderate hydraulic connection; or</li> <li>2. result in abstraction occurring when surface water flows or levels are less than prescribed minimum flows or groundwater levels for takes classified as Riparian, Direct or High hydraulic connection.</li> </ol>	<p><b>YES:</b> The proposal is deemed to not impact on surface water allocation or flows as proposed rate is less than 2l/s.</p>
<p><b>Policy 27 – Bore construction and management</b>            Require minimum standards for the construction, operation and maintenance of bores and wells.</p>	<p><b>YES:</b> The spring has been used in the past. It will be managed and maintained to standard</p>

The council has policies for consideration when deciding any resource consent applications, and therefore these are relevant to this proposal. These considerations are outlined in Policies 39- 43 and an assessment of this proposal against the relevant ones has been carried out in Table 7.4 below.



**Table 7.4: Assessment of Proposal against Policies 39 – 42 of Southland Water and Land Plan.**

<b>POLICY</b>	<b>ASSESSMENT</b>
<p><b>Policy 39 – Application of the permitted baseline</b> When considering any application for resource consent for the use of land for a farming activity, the Southland Regional Council should consider all adverse effects of the proposed activity on water quality, whether or not this Plan permits an activity with that effect</p>	<p><b>YES:</b> Consideration of all adverse effects has been carried out, including cumulative effects. Mitigation measures are proposed such as only applying FDE when there is a soil moisture deficit and applications are at low application rates</p>
<p><b>Policy 39A – Integrated management</b> When considering the cumulative effects of land use and discharge activities within whole catchments, consider:</p> <ol style="list-style-type: none"> <li>1. the integrated management of freshwater and the use and development of land including the interactions between freshwater, land and associated ecosystems (including estuaries); and</li> <li>2. through the Freshwater Management Unit process, facilitating the collective management of nutrient losses, including through initiatives such as nutrient user groups and catchment management groups</li> </ol>	<p><b>YES:</b> The cumulative effects have been considered and effects on surface water and groundwater have been assessed.</p>
<p><b>Policy 40 – Determining the term of resource consents</b> When determining the term of a resource consent consideration will be given, but not limited, to:</p> <ol style="list-style-type: none"> <li>1. granting a shorter duration than that sought by the applicant when there is uncertainty regarding the nature, scale, duration and frequency of adverse effects from the activity or the capacity of the resource;</li> <li>2. relevant tangata whenua values and Ngāi Tahu indicators of health;</li> <li>3. the duration sought by the applicant and reasons for the duration sought;</li> <li>4. the permanence and economic life of any capital investment;</li> <li>5. the desirability of applying a common expiry date for water permits that allocate water from the same resource or land use and discharges that may affect the quality of the same resource;</li> <li>6. the applicant’s compliance with the conditions of any previous resource consent, and the applicant’s adoption, particularly voluntarily, of good management practices; and</li> <li>7. the timing of development of FMU sections of this Plan, and whether granting a shorter or longer duration will better enable implementation of the revised frameworks established in those sections</li> </ol>	<p><b>YES:</b> Have considered Iwi Management Plan and a consent duration of 10 years is requested. 10 years is considered appropriate for this application given the low risk of environmental risk, the investment in effluent storage facilities. Good management practices will be carried out including monitoring.</p>
<p><b>Policy 41 – Matching monitoring to risk</b> Consider the risk of adverse environmental effects occurring and their likely magnitude when determining requirements for auditing and supply of monitoring information on resource consents.</p>	<p><b>YES:</b> Conditions which stipulate monitoring requirements have been proposed.</p>
<p><b>Policy 42 – Consideration of water permit applications</b> When considering resource consent applications for water permits to take and use water:</p>	<p><b>YES:</b> Water body is not over allocated. A water meter is installed at the take location. Rate of take is 2l/s.</p>



POLICY	ASSESSMENT
<p>1. except for non-consumptive uses, consent will not be granted if a water body is over allocated or fully allocated; or to grant consent would result in a water body becoming over allocated or would not allow an allocation target for a water body to be achieved within a time period defined in this Plan; and</p> <p>2. except for non-consumptive uses, consents replacing an expiring resource consent for an abstraction from an over-allocated water body will generally only be granted at a reduced rate, the reduction being proportional to the amount of over-allocation and previous use, using the method set out in Appendix O; and</p> <p>3. installation of water measuring devices will be required on all new permits to take and use water and on existing permits in accordance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010; and</p> <p>4. where appropriate, minimum level or flow cut-offs and seasonal recovery triggers on resource consents for groundwater abstraction will be imposed; and</p> <p>5. conditions will be specified relating to a minimum flow or level, or environmental flow or level regime (which may include flow sharing), in accordance with Appendix K, for all new or replacement resource consents (except for water permits for non-consumptive uses, community water supplies and water bodies subject to minimum flow and level regimes established under any water conservation order) for:</p> <p>(a) surface water abstraction, damming, diversion and use; and</p> <p>(b) groundwater abstraction in accordance with Policy 23.</p>	

The less than minor impact on water quality will also ensure that the relevant policies in the Freshwater Management Unit Process section (Policies 44 - 47) will be met and the application will be managed to ensure that any future water quality limits set out in those Freshwater Management Units are met.

The application is therefore considered to be consistent with all the relevant policies and objectives of the PSWLP.

## 7.7 Regional Water Plan for Southland 2010

The Regional Water Plan (RWP) for Southland was made operative in January 2010. It promotes the sustainable management of Southland's rivers, lakes and water resources. It is intended to be merged into the Proposed Water and Land Plan which is discussed above. As the relevant plans have not yet been merged into the Water and Land Plan, this plan still needs to be considered.

The relevant regional wide objectives and policies that this plan which could be applicable to this application relate to water quality, groundwater, land and soil and discharges in general. Table 7.5 assesses the proposal against the objectives of RWP that are relevant to this proposal.



**Table 7.5: Assessment of proposal against water quality objectives in Regional Water Plan for Southland.**

<b>OBJECTIVE</b>	<b>ASSESSMENT</b>
<p><b>Objective 1 – Natural State Waters</b> To maintain the quality of water where it is in its natural state</p>	<p><b>YES:</b> Proposal will not occur within National Parks, or within areas listed in Table 1 of Appendix M “Natural State Waters outside National Parks”.</p>
<p><b>Objective 2 – Maintain water quality</b> To manage water quality so that there is no reduction in the quality of the water in any surface water body, beyond the zone of reasonable mixing for discharges, below that of the date this Plan became operative (January 2010).</p>	<p><b>YES:</b> Proposal is not for the discharge of contaminants directly into surface water ways. There will be no zone of reasonable mixing.</p>
<p><b>Objective 3 – Surface water bodies other than in Natural State Waters</b> To maintain and enhance the quality of surface water bodies so that the following values are protected where water quality is already suitable for them, and where water quality is currently not suitable, measurable progress is achieved towards making it suitable for them.</p> <p>In surface water bodies classified as mountain, hill, lake-fed, spring-fed, lowland (hard bed), lowland (soft bed) and Mataura 1, Mataura 2 and Mataura 3:</p> <ul style="list-style-type: none"> <li>(a) bathing, in those sites where bathing is popular;</li> <li>(b) trout where present, otherwise native fish; (c) stock drinking water;</li> <li>(d) Ngāi Tahu cultural values, including mahinga kai;</li> <li>(e) natural character including aesthetics.</li> </ul> <p>In surface water bodies classified as mountain lakes and hill lakes:</p> <ul style="list-style-type: none"> <li>(a) bathing</li> <li>(b) trout</li> <li>(c) Ngāi Tahu cultural values, including mahinga kai</li> <li>(d) natural character including aesthetics</li> </ul> <p>In surface water bodies classified as lowland/coastal lakes:</p> <ul style="list-style-type: none"> <li>(a) native migratory fish;</li> <li>(b) stock drinking water;</li> <li>(c) healthy aquatic habitats;</li> <li>(d) Ngāi Tahu cultural values, including mahinga kai;</li> <li>(e) natural character including aesthetics</li> </ul>	<p><b>YES:</b> As demonstrated in the AEE, low application rates, and incorporation of buffers from surface water ways and other mitigations mean that proposal discharge will not result in a reduction in overall freshwater quality.</p>
<p><b>Objective 4 – Gradual improvement in surface water quality parameters</b> To manage the discharge of contaminants and encourage best environmental practice to improve the water quality in surface water bodies classified as hill, lowland (hard bed), lowland (soft bed) and spring fed, and in particular to achieve a minimum of 10 percent improvement in levels of the following water quality parameters over 10 years from the date this Plan became operative (January 2010):</p> <ul style="list-style-type: none"> <li>(a) microbiological contaminants</li> <li>(b) nitrate</li> <li>(c) phosphorus</li> <li>(d) clarity</li> </ul>	<p><b>YES:</b> No direct discharge into surface water bodies is proposed and best practices will be carried out. Future technology improvements will be regularly considered to assist with improving the proposed activity.</p>



OBJECTIVE	ASSESSMENT
<p><b>Objective 8 – Drinking Water Standard</b>            To maintain groundwater quality in aquifers that already meet the Drinking-Water Standards for New Zealand 2000; and            (b) To enhance groundwater quality in aquifers degraded by land use and discharge activities (with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2000) to ensure general compliance with the Drinking-Water Standards for New Zealand 2000 by the year 2010.</p>	<p><b>YES:</b> The proposal is unlikely to result in contamination of groundwater to the extent that the drinking water standard is exceeded, especially with the significant reduction in nitrogen losses.</p>
<p><b>Objective 9 – Sustainable abstraction</b>            To ensure that the total volume and rate of groundwater abstraction is sustainable.</p>	<p><b>YES:</b> The volume of take is reasonable for its intended use and will be used efficiently.</p>
<p><b>Objective 9A – Maintain soil quality</b>            To manage discharges onto or into land so that the quality and structure of soil resources are maintained.</p>	<p><b>YES:</b> Proposal will be managed so that soil quality is not adversely affected. Nutrients are being added which increase quality. The wintering barns protect soil from damage during wet conditions.</p>
<p><b>Objective 9B – Human health</b>            To manage discharges onto or into land so that adverse effects on human health are avoided</p>	<p><b>YES:</b> Appropriate buffers and mitigations are proposed which ensure that adverse effects on human health are avoided.</p>
<p><b>Objective 9C – Habitats and ecosystems and other values</b>            To manage discharges onto or into land so that any adverse effects on:            (a) the diversity and integrity of habitats and ecosystems; and            (b) amenity and historic heritage values are avoided, remedied or mitigated to ensure that these values are maintained or enhanced</p>	<p><b>YES:</b> Proposal will be managed in a way that ensures that there are no adverse effects on habitats and ecosystems and amenity or historic heritage values.</p>

The proposal against the polices of the Regional Water Plan that relate to water quality, groundwater, land, soil and discharges are accessed in Table 7.6 below.



**Table 7.6: Assessment of proposal against policies of Regional Water Plan for Southland.**

<b>POLICY</b>	<b>ASSESSMENT</b>
<p><b>Policy 1A – Take into account Iwi Management Plans</b> Any assessment of an activity covered by this plan must take into account any relevant Iwi Management Plan</p>	<p><b>YES:</b> The proposal has considered the relevant Iwi Management Plan</p>
<p><b>Policy 1 – Surface water body classes</b> (a) Recognise the different characteristics of the following surface water body classes when managing discharges: (i) Natural State Waters (ii) Lowland (hard bed) (iii) Lowland (soft bed) (iv) Hill (v) Mountain (vi) Lake-fed (vii) Spring-fed (viii) Maitara 1 (ix) Maitara 2 (x) Maitara 3 (xi) Lowland/coastal lakes and wetlands (xii) Hill lakes and wetlands (xiii) Mountain lakes and wetlands (b) Apply water quality standards established under any Water Conservation Order.</p>	<p><b>YES:</b> The proposal is not for the discharges directly into any of the listed surface waterbodies. Water quality standards for all water body classes will continue to be met.</p>
<p><b>Policy 2 – Natural State Waters</b> Provide for discharges to Natural State Waters only where there will be no measurable adverse effects on existing water quality beyond the zone of reasonable mixing, unless it is consistent with the sustainable management of natural and physical resources as set out in Part 2 of the Resource Management Act 19</p>	<p><b>Not Applicable:</b> The proposal will not discharge into Natural State Waters and as it is not a discharge to water there will be no zone of reasonable mixing.</p>
<p><b>Policy 3 – No reduction in water quality</b> Notwithstanding any other policy or objective in this plan, allow no discharges to surface water bodies that will result in a reduction of water quality beyond the zone of reasonable mixing, unless it is consistent with the promotion of the sustainable management of natural and physical resources,</p>	<p><b>Not Applicable:</b> The proposal will not discharge into surface water bodies and therefore there will be no zone of reasonable mixing.</p>
<p><b>Policy 4 – Surface water bodies outside Natural State Waters</b> For surface water bodies outside Natural State Waters, manage point source and non-point source discharges to meet or exceed the water quality standards referred to in Rule 1 and specified in Appendix G “Water Quality Standards”, unless it is consistent with the promotion of the sustainable management of natural and physical resources, as set out in Part 2 of the Resource Management Act 1991, to do so and so avoid levels of contaminants in water and sediments that could harm the health of humans,</p>	<p><b>YES:</b> The proposal will not directly discharge into any surface water body outside of Natural State Waters and the water quality standards referred to in Rule 1 and specified in Appendix G “Water Quality Standards” will continue to be met.</p>



POLICY	ASSESSMENT
domestic animals including stock and/or aquatic life.	
<b>Policy 5 – Discharges to water in artificial watercourses</b>	<b>Not Applicable</b>
<p><b>Policy 6 – Non-regulatory methods</b></p> <p>(a) Use non-regulatory methods, in addition to rules, to maintain and enhance surface water and groundwater quality, and to avoid, remedy or mitigate adverse effects on soil quality.</p> <p>(b) Assess on an ongoing basis whether the adoption of nonregulatory methods has resulted in improvements to water or soil quality, and consider the introduction of other interventions if improvements have not resulted.</p>	<b>Not Applicable</b>
<p><b>Policy 7 – Prefer discharges to land</b></p> <p>Prefer discharges to land over discharges to water where this is practicable, and the effects are less adverse.</p>	<b>YES:</b> The proposed FDE application to land is consistent with this policy.
<b>Policy 8 – Discharges to water</b>	<b>Not Applicable:</b> Proposal is not for the discharge to water.
<b>Policy 9 – Zone of reasonable mixing</b>	<b>Not Applicable:</b> Proposal is not for the discharge into waterways where there would be a zone of mixing.
<b>Policy 10 - Use of diffusers</b>	<b>Not Applicable</b>
<p><b>Policy 11 – Stormwater discharges</b></p> <p>Apply consent conditions requiring consented discharges of stormwater to meet both the ANZECC sediment guidelines (as shown in Appendix E of this Plan) and the relevant water quality standards specified in Appendix G “Water Quality Standards” following reasonable mixing to:</p> <p>(a) all resource consents for new stormwater discharges; and</p> <p>(b) all new resource consents for existing stormwater discharges.</p> <p>Unless it is consistent with the purpose of the Act to allow further time, existing discharges will be required to meet the standards and guidelines by 2010 or the date the resource consent commences, whichever is the latter.</p>	<b>Not Applicable</b>
<b>Policy 12 – Application of agrichemicals and vertebrate pest control poisons</b>	<b>Not Applicable</b>
<b>Policy 13 – Discharge of untreated effluent</b>	<b>Not Applicable.</b> No discharge of effluent to water





POLICY	ASSESSMENT
<p>Avoid the point source discharge of raw sewage, foul water and untreated agricultural effluent to water.</p>	
<p><b>Policy 13A – Transitional policy relating to the establishment of new dairy farms</b>            (a) Recognise that the establishment of new dairy farms poses risks to water quality, including the quality of water in coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands, that need to be addressed when establishing a new dairy farm.            (b) Manage the risk posed by the establishment of new dairy farms by requiring resource consent and requiring the documentation of risks and measures to avoid or mitigate them in a Conversion Environmental Plan.            (c) Consideration should be given to, but not be limited to, the following matters;            (i) the assimilative capacity and drainage characteristics of the soil and consequential effects on water quality;            (ii) the risks posed by the establishment of a new dairy farm to the water quality of water bodies, coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands;            (iii) the extent to which those risks can be avoided or mitigated through measures proposed in the Conversion Environmental Plan;            (iv) the likely effectiveness of the measures contained in the Conversion Environmental Plan;            (v) how, and within what timeframe, those measures will be implemented.            (d) Where the risks to the water quality of water bodies, coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands cannot be avoided or mitigated, the Council may decline consent for the establishment of a new dairy farm.</p>	<p><b>YES:</b> There have been many mitigations in place for the activity to ensure the effects on water quality are less than minor as demonstrated in the AEE. These include low application rates, incorporation of buffers from surface water ways, no intensive grazing or use of wintering crops, the use of wintering barns to be utilised in times when weather conditions are poor, capturing effluent and applying in times when plant uptake is increased and other mitigations which mean that the proposal discharge will not result in a reduction in overall freshwater quality.</p> <p>A Farm Management and Conversion Environment Plan, and Effluent Management Plan have been supplied with this application and provides details to ensure the proposed activity is meeting this policy.</p>
<p><b>Policy 25 - Adverse effects arising from point source and non-point source discharges</b>            To avoid, remedy or mitigate the adverse effects arising from point source and non-point source discharges so that there is no deterioration in groundwater quality after reasonable mixing, unless it is consistent with the promotion of the sustainable management of natural and physical resources, as set out in Part 2 of the Resource Management Act 1991, to do so.</p>	<p><b>YES:</b> Given the mitigation proposed in relation to the proposal adverse effects on groundwater quality are unlikely.</p>
<p><b>Policy 26 - Adverse effects of bores and wells</b>            To avoid the adverse effects on groundwater quality and quantity arising from bores and wells by ensuring that bores and wells are appropriately designed, constructed and maintained in a way that adverse effects are avoided to the extent practicable.</p>	<p><b>YES:</b> Water abstraction will not significantly impact other bores. Buffers around bores ensure adverse effects are avoided.</p>
<p><b>Policy 27 – Groundwater research and investigation</b></p>	<p><b>Not Applicable</b></p>



POLICY	ASSESSMENT
<p><b>Policy 28 - To manage groundwater abstraction</b> To manage groundwater abstraction to avoid significant adverse effects on:</p> <ul style="list-style-type: none"> <li>• long-term aquifer storage volumes</li> <li>• existing water users</li> <li>• surface water flows and aquatic ecosystems and habitats</li> <li>• groundwater quality</li> </ul>	<p><b>YES:</b> The abstraction of groundwater is not expected to have any adverse effects on those listed under policy 28 as assessed in Section 6.2 above.</p>
<p><b>Policy 29 – Stream depletion effects</b> (a) Manage the stream depletion effect of any groundwater abstraction with a rate of take exceeding 2 litres per second as follows</p>	<p><b>Not Applicable:</b> The take is for less than 2 L/s so this policy is not applicable.</p>
<p><b>Policy 30 – Groundwater abstraction</b> (a) Use a staged management approach to allocate groundwater for abstraction in Southland to allow the knowledge gained by the progressive development of the region’s groundwater resources to be built into its future management...</p>	<p><b>YES:</b> The adverse effects arising from the take are expected to be less than minor. The proposed take is 0.1% of the available water for allocation. The rate of take is less than 2L/s.</p>
<p><b>Policy 31 - Interference effects</b> (a) Limit the cumulative interference effect of any new groundwater abstraction (in conjunction with other lawfully established groundwater takes) to no more than 20 percent of the available drawdown in any unconfined aquifer or up to 50 percent of the potentiometric head in any confined aquifer. The effects on any neighbouring bore will be considered where that bore is lawfully established and an assumption will be made that the bore fully penetrates the aquifer. An increased volume or increased pumping rate for any lawfully established groundwater abstraction will be considered a new groundwater abstraction under this policy.</p>	<p><b>YES:</b> The proposed water take is expected to have less than minor effect on the closest bore. This is because the bore is 900 m away and the take is for less than 2 L/s. As mentioned in Land Water Peoples Groundwater Provisions of the Proposed Southland Water and Land Plan: Technical background “Experience (and improved knowledge of the hydrogeological environment) has shown the groundwater takes of less than 86 m3/day are unlikely to result in more than minor effects on well interference effects”. “The only situation where such abstraction could potentially be an issue is where pumping bores are in close proximity (e.g. immediately adjacent across a property boundary)”.</p>
<p><b>Policy 31A – Matching discharges onto or into land to risk</b> Match the level of management that is required for discharges of contaminants onto or into land to the level of environmental risk posed by the following risk factors:</p> <ul style="list-style-type: none"> <li>(a) Nature and quantity of contaminants in the discharge</li> <li>(b) Sloping land</li> <li>(c) Soils with artificial drainage or coarse structures</li> <li>(d) Soils with impeded drainage or low infiltration rates</li> <li>(e) Well drained soils</li> <li>(f) Climate</li> <li>(g) Proximity to groundwater</li> <li>(h) Proximity to surface water</li> <li>(i) Soil’s current physical, chemical and biological characteristics and its potential to leach nutrients</li> </ul>	<p><b>YES:</b> The risk from the listed factors in this policy have been considered when establishing the proposed management criteria.</p>



POLICY	ASSESSMENT
(j) Natural hazards (for example, flooding and erosion)	
<p><b>Policy 31B – Natural State Catchments</b> Recognise that discharges onto or into land in the catchments of Natural State Waters can have adverse effects on water quality, and manage such discharges in accordance with Policy 2 and Policy 31A of this Plan</p>	<p><b>Not Applicable:</b> Proposal managed in accordance with Policy 2 and Policy 31A.</p>
<p><b>Policy 31C – Manage discharges of contaminants onto or into land</b> Manage discharges of contaminants onto or into land to avoid, remedy or mitigate adverse effects, including on:</p> <ul style="list-style-type: none"> <li>(a) soil quality;</li> <li>(b) amenity values;</li> <li>(c) habitats, ecosystems and indigenous biological diversity;</li> <li>(d) historic heritage, cultural and traditional values;</li> <li>(e) natural character;</li> <li>(f) outstanding natural features.</li> </ul>	<p><b>YES:</b> Cumulative effects have been considered and proposal will be managed in a way that ensures adverse effects on any of the features listed in Policy 31C are avoided.</p>
<p><b>Policy 31D – Beneficial reuse</b> Encourage the beneficial reuse of materials where this is appropriate and promote discharges of these materials onto or into land to maximise the potential reuse of the nutrients and water contained in the discharge.</p>	<p><b>YES:</b> Nutrients are being reused in a way that is beneficial.</p>
<p><b>Policy 35 – Stock access to surface water</b> (a) Encourage the exclusion of all stock from surface water bodies and artificial watercourses where practicable. (b) Ensure that when stock access to surface water bodies and artificial watercourses occurs, this is managed in a manner that avoids significant adverse effects on:</p> <ul style="list-style-type: none"> <li>(i) water quality;</li> <li>(ii) bed and bank integrity and stability;</li> <li>(iii) aquatic, riverine and riparian ecosystems and habitats</li> </ul>	<p><b>YES:</b> All waterbodies are fenced, and crossings are bridged over. Bed disturbance from stock is thus avoided and dairy cattle on the dairy platform are excluded from waterbodies.</p>
<p><b>Policy 41 – Adverse effects of agricultural effluent ponds</b> Avoid adverse effects on water quality, and avoid as far as possible other adverse environmental effects, associated with the location, design, construction, operation and maintenance of agricultural effluent ponds.</p>	<p><b>YES:</b> The effluent pond is designed to the required standard, will be certified prior to implementation and an appropriate management plan is in place.</p>
<p><b>Policy 42 – Farm Dairy Effluent</b> Avoid adverse effects on water quality and other adverse environmental effects associated with the application of farm dairy effluent to land by matching farm dairy effluent management to receiving environment risk.</p>	<p><b>YES:</b> Low application rates are proposed which are appropriate for soil type, applications will only occur when climatic and soil conditions are suitable. Adverse risks are mitigated.</p>
<p><b>Policy 42 A</b> - Provide for the discharge of farm dairy effluent to land that is lawfully being undertaken up to and including 17 July 2010.</p>	<p><b>Not Applicable.</b> Effluent was not being applied to land up to 2010.</p>



POLICY	ASSESSMENT
<p><b>Policy 43</b> - Match consent duration and inspection and audit requirements on resource consents to apply farm dairy effluent to land to the level of risk of adverse environmental effects.</p>	<p><b>YES:</b> Proposed consent duration is appropriate and is in line with risks and national guidelines.</p>

The proposal is considered to be consistent with the relevant wider policy framework of the Water Plan.

## 7.8 Regional Effluent Land Application Plan for Southland

This plan became operative from 30 May 1998. This plan is currently under review, and it is proposed to integrate the Land Application Plan into the Land and Water Plan in the future.

The relevant objectives aim to protect water quality and the life supporting capacity of the soil and water ecosystems are safeguarded from the adverse effects of discharges of effluent and sludge onto or into land which may enter water. (Objectives 4.1.1 and 4.1.2). The policies related to these objectives look to ensure the sustainability of the soil ecosystem and aim to utilise the land treatment of effluent and sludge where this can be undertaken in a sustainable manner and without significant adverse effects (Policies 4.2.1- 4.2.3).

Human and animal health is also considered. Objective 4.1.3 and Policy 4.2.6 aims to ensure that effluent and sludge discharges onto or into land do not adversely affect human and animal health. With Policy 4.2.4 stating that a precautionary approach to the discharge of effluent and sludge onto or into land should be taken where there are uncertainties regarding adverse effects.

Objectives 4.1.4 and 4.1.6 state that amenity values and significant vegetation or habitats are not adversely affected by discharges of effluent and sludge onto or into land. These are governed by Policies 4.2.9 and 4.2.15. The protection of these values leads to Objective 4.1.5 which ensure that the relationship of tangata whenua with ancestral sites, wahi tapu and other taoka are recognised and provided for (Policy 4.2.8).

There are other relevant policies designed to help achieved some of above objectives. These include Policy 4.2.10 monitoring of effects, Policy 4.2.7 which promotes good practice, management and maintenance of effluent and sludge systems.; and Policy 4.2.13 which promotes the development and use of properly deigned and managed sludge treatment facilities.

The application of FDE to land are from properly designed and managed collection and storage facilities on the 444 Farm. There are proposed conditions around buffer distances, application rates and depth, timing of application to soils all aim to ensure sustainability of soil and water ecosystems. The proposal utilises land application of FDE in a way that will not have adverse effects on human health. The restrictions to application (hydraulic and nutrient loading) can be seen as taking a precautionary approach. Amenity values and significant vegetation are protected, incorporating tangata whenua values. Good management practices will be adhered too, and potential effects monitored to ensure compliance.

Overall, the discharge of FDE is considered to be consistent with the relevant policy framework of the Regional Effluent Land Application Plan.



## 7.9 Iwi Management Plan

The Iwi Management Plan is a natural resource and environmental iwi management plan developed by Ngāi Tahu ki Murihiku. The purpose of the Plan is to provide a document that can assist Ngāi Tahu ki Murihiku to effectively participate in natural resource planning. Many of the policies relate to the way in which Ngāi Tahu ki Murihiku aims to operate. However, it is also designed as a resource for local authorities to ensure Ngāi Tahu ki Murihiku issues and policies are provided for. It helps councils determine the nature and extent of consultation required with respect to specific activities or areas of importance.

The policies within the Iwi Management Plan are outlined in seven separate chapters, with Chapter 3.5-Southland Plains being relevant to this proposal. The application is not for activities in Fiordland or coastal areas, so coastal environment and high country/foothills chapters do not apply.

In Chapter 3.5 Southland Plains the relevant sections are 3.5.1 Farm Effluent Management, Section 3.5.10 General Water Policy, Section 3.5.13 Water Quality and Section 3.5.14 Water Quantity – Abstractions.

The policies deemed to be relevant from each of these sections are identified in Table 7.7 and discussed below:

**Table 7.7: Assessment of proposal against policies of Te Tangi a Taurira (Southland Iwi Management Plan).**

<b>Section 3.5.1 Farm Effluent Management</b>
<ol style="list-style-type: none"> <li>1. Promote the inclusion of Ngāi Tahu ki Murihiku issues and policies in statutory plan provisions, best practice guidelines, and industry standards for managing dairy farm effluent.</li> <li>2. Ensure that Ngāi Tahu ki Murihiku are provided with the opportunity to participate through pre hearing meetings or other processes in the development of appropriate consent conditions for discharge consents, including monitoring conditions.</li> <li>3. Discharge of farm effluent to land must always require resource consent.</li> <li>4. Sustain and safeguard the life supporting capacity of soils for future generations.</li> <li>5. Avoid using high-risk soils of high permeability, including Waikoikoi clay and peat, for spray irrigation of effluent.</li> <li>6. Oppose the discharge of dairy farm effluent to water.</li> <li>7. Require soil risk assessments (type and percolation of the soils) prior to consent for discharge to land, to assess the suitability and capability of the receiving environment. Effluent should be applied at rates that match the ability of land to absorb it.</li> <li>8. Require best practice for land application of managing farm effluent, in order to minimise adverse effects on the environment. This includes:             <ol style="list-style-type: none"> <li>a. application rates that are specific to region and soil type;</li> <li>b. use of low-rate effluent irrigation technology;</li> <li>c. use of appropriate irrigation technology to avoid irrigating over tile drains (e.g. K-line);</li> <li>d. storing effluent when the soil is too wet or heavy to irrigate;</li> <li>e. storing effluent when heaving pugging by stock has occurred;</li> <li>f. sealed storage ponds to avoid leaching of nutrients to groundwater;</li> <li>g. avoiding ponding of effluent on paddocks;</li> <li>h. monitoring of soils and groundwater (see Policy 16);</li> <li>i. developing contingency plans (e.g. for exceptionally wet years).</li> </ol> </li> <li>9. Require that farm management plans include the location and extent of tile drains on the farm, in order to ensure that farm workers know where drains are when they irrigate.</li> <li>10. Advocate for the re-evaluation of existing discharge to land consents to develop better systems where needed.</li> </ol>



11. Avoid any surface run off /overland flow, ponding or contamination of water resulting from the application of dairy shed effluent to pasture.
12. Require that farm management plans include provisions for the establishment and maintenance of riparian areas, to mitigate the effects of discharge.
13. Require the establishment of appropriate buffer zones between discharge activities and waterways (including ephemeral and waterways <3 m). The size of buffer zones should reflect local geography (e.g. size of the waterway, nature and extent of existing riparian area, boundary fences).
14. Require the establishment of buffer zones of at least 100m between discharge activities and bores.
15. All spray drift, as a product of spray irrigation of effluent, must be managed and contained within the boundaries of the consent area.
16. Require monitoring provisions as a condition of consent on any discharge to land. This should include monitoring water quality (e.g. representative water samples upstream and downstream), and soil nitrogen loads.
17. Advocate for duration not exceeding 25 years for discharge of farm effluent to land consent applications, with opportunities for review within that time. The duration of consents must reflect potential risk to soils and water.

#### **Section 3.5.10 General Water Policy**

1. The role of Ngāi Tahu ki Murihiku as kaitiaki of freshwater must be given effect to in freshwater policy, planning and management.
2. Work with local authorities and other statutory agencies involved in freshwater management to ensure that cultural values and perspectives associated with freshwater management are reflected in statutory water plans, best practice guidelines and strategies, and in resource consent processes for activities involving water.
3. Protect and enhance the mauri, or life supporting capacity, of freshwater resources throughout Murihiku.
4. Manage our freshwater resources wisely, mō tātou, ā, mō ngā uri ā muri ake nei, for all of us and the generations that follow.
5. Promote the management of freshwater according to the principle of ki uta ki tai, and thus the flow of water from source to sea.
6. Promote catchment management planning (ki uta ki tai), as a means to recognise and provide for the relationship between land and water.
7. Ngāi Tahu's right to development, as per the Treaty of Waitangi, must be recognised and provided for with respect to future development and commercial activities in Fiordland, including the export of water.
8. Protect and enhance the customary relationship of Ngāi Tahu ki Murihiku with freshwater resources

#### **Section 3.5.13 Water Quality**

1. The role of Ngāi Tahu ki Murihiku as tangata whenua and kaitiaki of water must be recognised and provided for in all water quality management.
2. Strive for the highest possible standard of water quality that is characteristic of a particular place/waterway, recognising principles of achievability. This means that we strive for drinking water quality in water we once drank from, contact recreation in water we once used for bathing or swimming, water quality capable of sustaining healthy mahinga kai in waters we use for providing kai.
3. Require cumulative effects assessments for any activity that may have adverse effects of water quality.
4. Avoid compromising water quality as a result of water abstractions.
5. Avoid the use of water as a receiving environment for the direct, or point source, discharge of contaminants. Generally, all discharge must first be to land.
6. Avoid impacts on water as a result of inappropriate discharge to land activities.
7. When assessing the effects of an activity on water quality, where the water source is in a degraded state, the effects should be measured against the condition that the water source should be, and not the existing condition of the water source (see text box on this page).
8. Promote the restoration of wetlands and riparian areas as part of maintaining and improving water quality, due to the natural pollution abatement functions of such ecosystems.
9. Require the use of buffer zones, riparian areas, bunds and other mechanisms to prevent stormwater and other wastewater from entering waterways.



10. Water quality definitions, categories, and standards must be determined, measured, and assessed with cultural values and indicators alongside scientific information. Such indicators and values centre on the ability of the waterway to support life, and the fitness of water for cultural uses.

11. Require robust monitoring of discharge permits, to detect non-compliance with consent conditions. Non-compliance must result in appropriate enforcement action to discourage further non-compliance.

### **Section 3.5.14 Water Quantity – Abstractions**

1. Adopt the precautionary principle when making decisions on water abstraction resource consent applications, with respect to the nature and extent of knowledge and understanding of the resource.

2. Support and encourage catchment management plans, based on the principle of ki uta ki tai, to manage the cumulative impacts of water abstractions in a given area.

3. Require that scientifically sound, understandable, and culturally relevant information is provided with resource consent applications for water abstractions, to allow Ngāi Tahu ki Murihiku to fully and effectively assess cultural effects.

4. In the Southland Plains region, the preference of Ngāi Tahu ki Murihiku is for water takes from bores, as opposed to surface water abstractions.

5. Recommend, as a condition of consent, that any application for irrigation puts in on-farm rainwater holding facilities, to help with dairy washdown and irrigation

6. Encourage water users to be proactive and use water wisely. To encourage best practice and efficient use of water, particularly in terms of:

- sustainable irrigation design, delivery and management;
- making best use of available water before water levels get too low;
- reducing the amount of water lost through evaporation by avoiding irrigating on hot windy days.

7. Consideration of consent applications for water abstractions should have particular regard to questions of:

- a. how well do we understand the nature and extent of the water resource;
- b. how well can we monitor the amount of water abstracted;
- c. whether land capability (e.g. soil type, vulnerability of underlying groundwater resources) matches the land use enabled by irrigation;
- d. what might happen in the future (e.g. rainfall and recharge of aquifers, climate change).

8. Applications for water abstractions may be required to undergo isotope/chemistry analysis determining where the water came from, and its age. This information will assist in the assessment of potential adverse effects on the water resource.

9. Applications for water abstractions may be required to justify the quantities of water requested. Information may need to be provided to Te Ao Mārama Inc. regarding the proposed water use per hectare, estimated water losses, stocking rates, and the level of efficiency for the scheme. This will enable iwi to put the quantity of water sought in context, and ensure that a test of reasonableness can be applied to consents.

10. Require catchment based cumulative effects assessments for activities involving the abstraction of water.

11. Avoid excessive drawdown of aquifer levels as a result of groundwater abstractions, and to ensure that abstractions do not compromise the recovery of groundwater levels between irrigation seasons.

12. The establishment of environmental flow regimes must recognise and provide for a diversity of values, including the protection of tangata whenua values.

13. Ensure that environmental flow allocation and water management regimes for rivers recognise and provide for the relationship between water quality and quantity.

14. Avoid compromising fisheries and biodiversity values associated with spring fed creeks and rivers for the purposes of water abstractions.

15. Avoid compromising river health as a result of water abstractions for hydro power generation.

16. Encourage the installation of appropriate measuring devices (e.g. water meters) on all existing and future water abstractions, to accurately measure, report, and monitor volumes of water being abstracted, and enable better management of water resources.

17. Advocate for durations not exceeding 25 years on resource consents related to water abstractions.

18. Require, where necessary, a consent condition providing for a review of the volumes able to be abstracted from the bores on the basis of the observed seasonable recovery of groundwater levels. Also include a provision for review of both the annual recovery between individual irrigation seasons and the cumulative effects on longer-term water level recovery.



19. Require that Ngāi Tahu are provided with the opportunity to participate through pre hearing meetings or other processes in the development of appropriate consent conditions including monitoring conditions to address our concerns.
20. Avoid adverse effects on the base flow of any waterway, and thus on the mauri of that waterway and on mahinga kai or taonga species.
21. Oppose any further abstractions/diversions of water from the Waiau River for hydroelectric generation, as current levels of abstractions are having adverse effects on cultural values associated with the river.
22. Ngāi Tahu's right to development, as per the Treaty of Waitangi, must be recognised and provided for with respect to water allocation from freshwater resources.

The proposal recognizes Ngāi Tahu ki Murihiku as a guardian of the natural resource. The proposal applies only for continuation of activities to actively farmed land which ensures that there is no change in effects to culturally sensitive sites. The proposal aims to always operate at best management practice. The proposed mitigations are considered sufficient to avoid adverse effects on cultural values.

Monitoring records are available for Iwi to access.

The proposal will not directly discharge FDE into the surface or groundwater resources and consent conditions will provide buffer zones and prevent runoff or overland flow. The wintering barns and no intensive arable crops on the property will help to protect soils over winter. The take and use of water is for a reasonable amount for its intended purposes. This resource will be used efficiently.

As the proposal will not degrade or negatively impact the current status of soil and water quality, there will be a less than minor effect on any cultural values. As discussed above, the proposed activities are considered to achieve the policies and objectives set out in the Iwi Management Plan.

## 7.10 Summary

The proposal is a **discretionary activity** in accordance with the Land Application Plan, Regional Water Plan for Southland and the Proposed Southland Water and Land Plan.

It is proposed to carry out the activities in a manner that avoids adverse effects on soil and water. Given this, and the mitigation measures proposed, it is considered that the proposed activities are consistent with the relevant provisions of the RMA, national and regional planning documents.





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## 8 FDE APPLICATION CONTINGENCY PLAN

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### 8.1 Contingency Plan Requirements

Rule 5.4.6 (agricultural effluent) of the plan specifies a requirement for a contingency plan to be lodged with a consent application.

### 8.2 Spill Contingency Plan

There is a low risk of uncontrolled spills of FDE to roadways or water courses. This could occur:

- If storage ponds overflow or there is power or pump breakdowns;
- During transfer from the storage ponds to pods or slurry wagon operation; and
- During spreading.

As outlined in the effluent management plan attached to this application, in the event of a failure of equipment or requirement for emergency irrigation.

- Contact will be made with repairer to assess the problem;
- Complete repairs as soon as possible;
- Where necessary arrange for a vacuum tanker to empty directly from sump and spread effluent onto the discharge area; and
- If emergency irrigation is required due to an immediate issue, Environment Southland should be contacted.

The transfer of effluent to a slurry wagon from the storage ponds will occur in a locality and under conditions that minimise the potential for spills. Should they occur any material will be contained and either pumped into the tanker or back into the storage system.

Should a spill occur during spreading, all practical steps shall be taken to avoid discharge to surface water. In this situation any spilt material will be contained, will be prevented from moving into water courses where possible, and recovered to be spread onto land in a controlled manner.

### 8.3 Land Availability Contingency Plan

Contingency planning here comes under three main headings, as follows:

- **Area of suitable land** on the property is much larger than what is required for FDE application in any one year (i.e. only 140 ha is needed in total for the entire FDE production). If parts of the property are unavailable for FDE application for any reason, there is a reasonable expectation that other suitable parts of the property may in fact be available.
- **Paddock Selection:** There are paddocks in which to large extent do not have tile drains. These paddocks can be prioritised during less favourable conditions to minimise risk.
- **Storage:** There is sufficient storage volume to defer application until soil conditions improve.



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## 9 ALTERNATIVES

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### 9.1 Effluent Discharge

#### Off Site

Effluent could be transport and discharged off-site. This would be expensive and not a viable option.

#### Discharge to Surface Water

Effluent could be discharged to surface water. This is not considered as preference in Regional Land and Water Plan objectives is for discharges to land, which this application looks to consent.

### 9.2 Water Take

There are a number of potential water sources that could be considered for the shed and stock water take. However, some are simply not viable. The options are discussed below.

#### Rural Water Supply

It is understood that a rural water supply does not exist that could service the property therefore this is not considered a viable option.

#### Surface Water Abstraction

The Makarewa River from which surface water could be abstracted is approximately 1.3 km away from the farm and does not represent a viable alternative.

#### Groundwater

The abstraction of deeper groundwater could be a viable alternative; however, because this spring already exists and is in use, there is no reason why this spring should be decommissioned, in favour of an alternative groundwater supply.



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## 10 CONSULTATION AND NOTIFICATION

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### 10.1 Direct Consultation

In preparing this application, consideration has been given to who might be potentially affected by the proposal. As the proposal is deemed to have less than minor effects and there are appropriate set back distances from the proposed activities to waterways, neighbours, bores and the property boundary; no affected parties have been identified. No direct consultation has been carried out.

### 10.2 Determination of Public Notification

Section 95A (1) of the RMA requires consent authorities to follow the sequential assessment set out in section 95A when deciding whether to publicly notify an application for resource consent. This assessment is set out below.

#### Step 1: Circumstances When Public Notification is Mandatory

Section 95A(2)(a) requires that a consent authority must publicly notify an application if the applicant has requested public notification. Public notification of this application is not requested.

#### Step 2: Circumstances When Public Notification is Precluded

The proposal does not meet the criteria of 95A (5) because:

- (a) None of the relevant rules or environmental standards preclude public notification; and
- (b) The application is not for a controlled activity, residential activity, or prescribed activity.

#### Step 3: Certain Circumstances

The proposal does not meet the criteria of 95A (8), and therefore public notification is not required under 95A(7)(a), because:

- (a) The proposal is not subject to any rule or environmental standard that requires public notification; and
- (b) As concluded in section 6 of this report, the adverse effects of the activity will not be more than minor overall.

When assessing whether an activity will have or is likely to have adverse effects on an environment that are more than minor, for the purposes of determining public notification, section 95D requires that a consent authority:

- (a) Must disregard any effects on persons who own or occupy the land on which the activity will occur, and any adjacent land; and
- (b) May disregard an adverse effect of the activity if a rule or a national environmental standard permits an activity with that effect; and
- (c) Must disregard an adverse effect of the activity if the effect does not relate to a matter for which a rule or a national environmental standard restricts discretion; and
- (d) Must disregard any effect on any person who has given written approval to the application.

An assessment of the environmental effects of the proposal is set out in Section 6 of this report, which has been undertaken with reference to the activity being a classed as a **Discretionary Activity** and the following potential effects are deemed to be relevant to this resource consent application. That assessment concluded that the proposal would have less than minor effects on:

- Effect on soil and plants
- Effects on groundwater



- Effects on surface water
- Effects on habitats
- Effects on Air
- Effects on amenity, community, and cultural values

#### Step 4: Special Circumstances

The scale of the proposal and its associated effects are reasonably anticipated by the Regional Effluent Land Application Plan. Consequently, it is considered that there are no special circumstances that exist that would warrant public notification of the application, therefore in accordance with section 95A(9)(b) the application must not be publicly notified.

It should be noted that there are consents of a similar nature granted in the Southland region for comparable activities. The key effects on the environment from these consents were comparable to this proposed application. The consent conditions in the comparable consents are judged to provide adequate environmental protection, such as the provision of maximum nitrogen loading and buffer distances from sensitive receiving environments. Similar environmental protection conditions are proposed within this application; therefore, it is considered that a non-notified decision pathway would be appropriate consistent for this application.

### **10.3 Determination of Limited Notification**

Section 95A(9)(b) requires that, if a consent authority does not publicly notify the application it must decide whether to give limited notification of the application under the provisions of section 95B. Section 95B (1) of the RMA requires consent authorities to follow the sequential assessment set out in section 95B when deciding whether to give limited notification of an application for resource consent. This assessment is set out below.

#### Step 1: Affected Parties and Groups

In accordance with section 95B (2), a determination must be made as to whether there are any customary rights groups or customary marine title groups that are affected by the proposal. In this regard, it is noted that there are no customary rights groups or customary marine titles groups affected by the proposed activity.

In accordance with section 95B (3), a determination must be made as to:

- (a) Whether the proposed activity is on, or adjacent to, or may affect, land that is subject to a statutory acknowledgement; and
- (b) Whether the person to whom the statutory acknowledgement is made is an affected person under section 95E.

The proposed activity is not within land subjected to a statutory acknowledgement, the effects are less than minor and Ngai Tahu and the local Runanga are not considered to be affected party.

As it has been determined that there are no parties deemed to be affected by the proposal, **limited notification is not required** under section 95B (4).

#### Step 2: Certain Circumstances

The proposal does not meet the criteria of 95B (6) because:

- (a) None of the relevant rules or environmental standards preclude public notification;
- (b) The application is not for a controlled activity, or prescribed activity.

In regard to section 95B (7), it is noted that the proposal does not require resource consent for a boundary activity or prescribed activity.



### Step 3: Affected Persons

Section 95B (8) requires a determination to be made as to whether there are any affected persons pursuant to section 95E. In making this determination, section 95E (3) provides that a person is not affected if:

- (a) The person has given and not withdrawn written approval for the activity to the consent authority, prior to a decision on affected persons being made; or
- (b) The consent authority is satisfied that it is unreasonable in the circumstances for the applicant to seek written approval.

Written approval has not been obtained from neighbouring properties as effects are considered to be less than minor and appropriate buffers from potentially sensitive sites have been proposed to be a condition.

For the purposes of determining limited notification, section 95E (1) directs that a person is an affected person if the consent authority decides that the activity's adverse effects on the person are minor or more than minor (but are not less than minor). Section 95E (2) requires that, when assessing an activity's adverse effects on a person, a consent authority:

- (e) May disregard an adverse effect of the activity on a person if a rule or a national environmental standard permits an activity with that effect; and
- (f) Must disregard an adverse effect of the activity on a person if the effect does not relate to a matter for which a rule or a national environmental standard reserves control or restricts discretion; and
- (g) Must have regard to every relevant statutory acknowledgement.

An assessment of the environmental effects of the proposal is set out in section 6 of this report. That assessment concluded that the proposal would have less than minor effects on:

- Effect on soil and plants
- Effects on groundwater
- Effects on surface water
- Effects on Air

In light of the conclusions made above, it is considered that there are no affected persons in regard to the proposal, **therefore limited notification is not required** under section 95B (9).

### Step 4: Special Circumstances

The proposal enables the reasonably anticipated continued use of land for rural production, and associated activities in Southland regional area. It is considered that there are no special circumstances which exist that would warrant limited notification under section 95B (10).

If there are persons who are considered affected, notice of the application must be given to them.

Ngai Tahu, have kaitiakitanga over the Murihiku region associated with these proposed activities. CGL has assessed the proposed activity against the Iwi Management Plan to provide guidance when considering effects on cultural values. Based on the assessment, it is considered that the application is consistent with the Iwi Management Plan and there are no adverse effects to cultural values.

Section 95E(3)(b) of the RMA provides that despite anything else in section 95E, a consent authority must decide that a person is not an affected person if it is unreasonable in the circumstances to seek the person's written approval.



It is also noted that Rule 17A (Transitional rule relating to the establishment of new dairy farms) contained in the Regional Water Plan for Southland identifies that notification is not needed. Specifically, it notes at (b):

*Subject to (c) an application for resource consent under (a) does not need to be notified or served on any person unless the applicant requests or the Council considers that special circumstances warrant notification.*

When taking into consideration the above, it is considered the effects from the application are less than minor and the processing of the consent applications should be considered on a **non-notified basis**.



## 11 SUGGESTED CONDITIONS

### 11.1 Proposed Changes to Discharge Consent Conditions

The current discharge permit to discharge agricultural effluent to land (AUTH-20211143-02) was granted in June 2021. Some minor changes are required to this consent, so it is relevant for the proposed farming system. These include the ability for the discharge of dairy shed effluent (not just from the wintering barn) but also from milking cows. There is also the need to include additional areas of the Tuffin Block, Hancox Block and Harwood Block.

Where the following conditions require changing, changes are indicated as strikethrough (words deleted), while **bold** indicates additional wording.

A list of conditions that are proposed to be changed are presented in Table 11.1.

**Table 11.1: Summary of relevant conditions requiring variation.**

Condition No.	Change
Details of Permit	To allow for the discharge of wintering barn effluent AND dairy shed effluent to the whole property (except Shark's Tooth Block): Additional legal descriptions Sec 298 Block VI Forest Hill HUN, Lot 2 DP 13790, Lot 3 DP 13790 and Lot 1 DP 13793).
1	Will need to be exercised in conjunction with the proposed farming consent.
2	Needs to allow for the discharge of effluent from the dairy shed and a change to the hectares receiving effluent.

#### Details of Permit

Purpose for which permit is granted: To discharge wintering barn effluent **& dairy shed effluent** to land via low-rate pod system and a slurry tanker.

Location - site locality 444 Springhills-Tussock Creek Road  
 - map reference NZTM2000 1250581E 4872599N  
 - groundwater zone Makarewa (pSWLP and RWP)  
 - physiographic zones Gleyed, Bedrock/Hill Country and Peat Wetlands  
 - catchment Makarewa River  
 - FMU Oreti

Legal description of land at the site: Lot 1 DP 12811, ~~& Part~~ Lot 2 DP 2005 **& Sec 298 Block VI Forest Hill HUN, Lot 3 DP 13790, Lot 2 DP 13790 and Lot 1 DP 13793**

#### Conditions Specific:

1. This consent shall be exercised in conjunction with:
  - (a) Land Use (Dairy **milking** Support) AUTH-20211143-~~XX~~;
  - (b) Land Use (Effluent Storage) Permit AUTH-20211143-03.



(c) Land Use (Wintering Barn) Permit AUTH-20211143-04.

2. This consent authorises the discharge of wintering barn effluent **& dairy shed effluent** ("agricultural effluent") onto land, via a land disposal system consisting of ~~atwo~~ **two** sludge beds and weeping walls, ~~two clay-lined effluent storage ponds~~ and a synthetically-lined effluent storage pond (authorised under AUTH-20211143-03) to a low rate pods system and a slurry tanker, as described in the application (APP-20211143) for resource consent dated 11 March 2021 and further information dated 2 June 2021 **and a variation request dated April 2022**. The activity shall be limited to:

(a) the discharge to land of wintering barn effluent generated from the use of the wintering barns (authorised under AUTH-20211143-04) by up to 456 **956** cows;

**(b) the discharge to land of dairy shed effluent;**

~~(b)~~ **(c)** the discharge to land of agricultural effluent via a low-rate pods system (or an equivalent low rate system);

~~(c)~~ **(d)** the discharge to land of agricultural effluent via a high-rate slurry tanker as a contingency measure;

~~(d)~~ **(e)** the discharge of agricultural effluent to an area of ~~149~~ **280.8** hectares as per the plan attached as Appendix 1; and

~~(e)~~ **(f)** the incidental discharge of agricultural effluent directly onto or into land from the pond which is within the normal operating parameters of a leak detection system, or the pond drop test criteria set out in Appendix P of the proposed Southland Water and Land Plan (Decisions Version) 2018, or any subsequent replacement versions.

Advice Note: Routine monitoring inspections of this consent may occur up 1 time a year. This number does not include any other required inspections.

**The map in Appendix A will also need to be changed to match that of the map provided in Figure 4.4: Effluent Discharge Area.**

## **11.2 Variation to Proposed Effluent Pond**

### **11.2.1 Introduction**

The land use consent for the construction, maintenance and use of an effluent storage pond for the storage of agricultural effluent (AUTH-20211143-03) was granted in June 2021. This was to allow for the storage of effluent from the wintering barn on the property which would hold up to 456 dairy support cows, which was sufficient storage in this instance.

As part of this proposal, CGL propose to milk 640 cows year-round with an additional winter barn which will also hold up to 200 cows from Capil Grove Farm over winter. The wintering barns will allow the cows to be housed during times where the weather is poor, and soils are not suitable for grazing.

This is an application for a dairy milking operation. As a result, the milking shed will be contributing to the farm dairy effluent all year round with a higher number of cows and not just when the barn is used as with the previous dairy support system that was recently granted. Consequently, an increase in storage is required. CGL also wants to improve their environmental performance and management of effluent by having enough storage where they can store effluent over all winter months and not have to apply effluent in May and September if the weather does not allow. Therefore, a storage pond size of 17,800 m<sup>3</sup> is proposed. It should be noted that this pond size is larger than the 16,200 m<sup>3</sup> required as calculated by the Massey University Pond Storage Calculator.





### 11.2.2 Proposed changes

Where the following conditions require changing, changes are indicated as strikethrough (~~words deleted~~), while **bold** indicates additional wording.

#### General Schedule of Conditions – General Conditions

1. This consent authorises the use of land for the construction, maintenance, and use, in accordance with the application for resource consent dated ~~11 March 2021~~ **XX 2022**, of a synthetically-lined effluent storage pond, with capacity to store no more than **517,800** cubic metres of effluent.
2. The effluent storage pond shall be located;

Legal Description	Part Lot 2 DP 2005
Map Reference NZTM 2000	<del>1250134E 4872523N</del> <b>1250231E 4872258N</b>

### 11.3 Variation to Proposed Wintering Barn

#### 11.3.1 Introduction

The land use consent for the use of a wintering barn (AUTH-20211143-04) was granted in June 2021. This was to allow for the housing of up to 456 cows.

As part of this proposal, CGL propose to milk 640 cows year-round. The current wintering barn does not have the capacity to hold this many cows and therefore a new wintering barn is required. The additional wintering barn would also house 200 cows from Capil Grove Farm over winter. The wintering barns will allow the cows to be housed during times where the weather is poor, and soils are not suitable for grazing.

#### 11.3.2 Proposed changes

Where the following conditions require changing, changes are indicated as strikethrough (~~words deleted~~), while **bold** indicates additional wording.

#### Details of Consent

Purpose for which permit is granted: Use of land for **atwo** wintering barns

Location - site locality 444 Springhills-Tussock Creek Road  
 - map reference NZTM2000 1250581E 4872599N  
 - groundwater zone Makarewa (pSWLP and RWP)  
 - physiographic zones Gleyed, Bedrock/Hill Country and Peat Wetlands  
 - catchment Makarewa River  
 - FMU Oreti

#### Schedule of Conditions

1. This resource consent authorises the use of land for **atwo** wintering barns as described in the application for resource consent dated ~~8 March 2021~~ **XXX 2022**. The activity shall be limited to;



- (a) the use of land for a **two** wintering barns for up to **456 a combined total of 956** cows; and
- (b) the use of the land for two wintering barns during adverse weather conditions.

2. This consent shall be exercised in conjunction with Discharge Permit AUTH-20211143-02 (or any subsequent variation versions).

3. The wintering barns shall be located;

- (a) as described in the table below;

Legal description	Part Lot 2 DP 2005
Map Reference of Wintering Barns (NZTM 2000)	1250217E 4872535N & <b>1250402E 4872352N</b>
Property address	444 Springhills-Tussock Creek Road, Springhills

4. The wintering barns shall not be located within:

- (a) 30 metres of any surface watercourse;
- (b) 100 metres of any water abstraction point;
- (c) 200 metres of any place of assembly or dwelling not on the subject property;
- (d) 20 metres of any mapped tile drains; and
- (e) 20 metres from any property boundaries.

5. The wintering barns shall be:

- (a) no greater than ~~4,590~~ **8,240**m<sup>2</sup> in area; and
- (b) constructed with a concrete liner to capture the effluent generated from the use of the wintering barns.

6. Liquid effluent generated on the wintering barns shall be captured by the drainage/collection channel located at the northern end of the structures.

7. This consent does not authorise the discharge of any liquid effluent or animal and vegetative waste produced as a result of the activity authorised by this consent being undertaken.

~~8. Within 3 months of exercising this consent, the Consent Holder shall repair the contraction cracks located by the scraper channel, as identified and recommended by the visual assessment conducted for the wintering barn on 21 May 2021 and submitted to the Consent Authority on 28 May 2021.~~

Advice Note: The Consent Holder shall discharge:

- (a) the wintering pads sludge and associated vegetative matter in accordance with Rule 38 of the Proposed Southland Water and Land Plan (Decisions Version) or any subsequent versions; and
- (b) the liquid effluent generated from the wintering pads in accordance with the conditions of Discharge Permit AUTH-20211143-02 (or any subsequent variation versions).

9. **8.** The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:

- (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;
- (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or



(c) ensuring the Oreti Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan or the National Policy Statement for Freshwater Management.

## 11.4 Proposed Conditions For Water Permit

Purpose for which permit is granted: To take and use groundwater for the purpose of stockwater, dairy shed washdown and feedpad washdown.

Location - site locality	444 Springhills-Tussock Creek Road
- map reference	NZTM2000 1250135E 4871243N
- groundwater zone	Makarewa (pSWLP and RWP)
- physiographic zones	Gleyed, Bedrock/Hill Country and Peat Wetlands
- catchment	Makarewa River
- FMU	Oreti

Legal description of land at the site: Lot 3 DP 13790

1. The permit authorises the taking of groundwater at the location specified above. The rate of abstraction shall not exceed:

- (a) 2 litres per second;
- (b) 85.8 cubic metres per day.

2. Prior to the first exercise of this consent, the Consent Holder shall install a backflow prevention device or take other appropriate measures to ensure water and/or contaminants cannot return to the water source.

3.

- a) Prior to the first exercise of this consent, the Consent Holder shall install a water meter to record the water take, within an error accuracy range of +/-5% over the meter's nominal flow range. The Consent Holder shall forward a copy of the installation certificate to the Consent Authority within one month of installing the water meter.
- b) The water meter shall be installed in a straight length of pipe, before any diversion of water occurs. The straight length of pipe shall be part of the pump outlet plumbing, easily accessible, have no fittings and obstructions in it.
- c) The Consent Holder shall ensure the full operation of the water meter at all times during the exercise of this consent. All malfunctions of the water meter during the exercise of this consent shall be reported to the Consent Authority within five working days of observation and appropriate repairs shall be performed within five working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within five working days of the completion of repairs.
- d) (i) If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the first exercise of this consent.  
(ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the first exercise of this consent.  
(iii) Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be completed and supplied to



the Consent Authority with receipts of service. These shall be supplied within five working days of the verification, and at any time upon request.

- e) The Consent Holder shall provide maintain a record of the total volume of water abstracted each month. The Consent Holder shall provide this record to the Consent Authority by 31 May each year and at any other time on request.

4. Prior to the exercise of this consent, the Consent Holder shall notify the Consent Authority of the person who is in charge of the operation this consent. If the person in charge changes during the term of this consent, the Consent Holder shall notify the Consent Authority of the new operator no later than five working days after that person takes responsibility.

5. The Consent Holder shall pay an annual administration and monitoring charge to the Consent Authority, collected in accordance with Section 36 of the Resource Management Act 1991.

6. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:

- a) adjusting the consented rate or volume of water under Condition 1, should monitoring under Condition 5 or future changes in water use indicate that the consented rate or volume is not able to be fully utilised;
- b) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage;
- c) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, National Policy Statement, Water Conservation Order, relevant plans and/or any relevant Regional Policy Statement; or
- d) adjusting or altering the method of water take data recording and transmission.



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## 12 PART TWO OF THE RESOURCE MANAGEMENT ACT

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### 12.1 Resource Management Act 1991

#### 12.1.1 Part 2 Considerations

Part 2 of the RMA sets out the purpose and principles of the Act. Section 5 states:

*"(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.*

*(2) In this Act, "sustainable management" means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*

*(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*

*(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*

*(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

In relation to the potential effects on the environment associated with the proposed activities, the assessments contained within this document have shown that subject to the implementation of the proposed controls, or mitigation approaches, the potentially affected resources of the area will be sustained along with their life-supporting capacity. The activities are deemed to be sustainable management of natural and physical resources.

Section 6 of the RMA identifies matters of national importance which shall be 'recognised and provided for'. The relevant matters that relate to this proposal are *"6(e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, wahi tapu, and other.*

The proposal has considered the Iwi Management Plan and the proposed activities, subject to the implementation of the proposed mitigation approaches, will ensure that the area's air, soil and groundwater resources are being used in an efficient manner.

Section 7 lists matters which all persons shall have regard to. This application has given particular regard to the efficient use and development of natural resources and the maintenance and enhancement of the quality of the environment. The application is considered to be consistent with all aspects of Section 7 of the Act. It is an efficient use of resources, recognises and maintains the identified values, and maintains the quality of the environment. It does not have more than minor adverse effects on any of these values or aspects of the environment.

In addition, section 8 of the RMA requires *"all persons exercising functions and powers"* under the Act to have regard to the principles of the Treaty of Waitangi (Te Tiriti o Waitangi). The proposed activity is not inconsistent with the principles of the Treaty of Waitangi and has considered Ngai Tahu's Iwi Management Plan.

Given the above assessment, the activities for which resource consents are required under this application promotes sustainable management and is consistent with Part 2 of the RMA.



### **12.1.2 Part 6 Considerations – Sections 104 to 107**

For any resource consent application, section 104 of the RMA requires the consent authority, in making a decision, to have regard to:

- The actual and potential effects on the environment of allowing the activity (section 104(1)(a)).
- Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity (section 104(1)(ab)); and
- Any relevant provisions of any national environmental standard, other regulation, national policy statement, coastal policy statement, regional policy statement or proposed regional policy statement, plan or proposed plan (section 104(1)(b)).
- Any other matters the consent authority considers relevant or necessary to consider (section 104(1)(c)).

The actual and potential effects associated with the activities for which resource consents are being sought have been assessed in Section 6 of this document (section 104(1)(a)). The measure implemented to ensure positive effects on the environment are also discussed in Section 6 of this document (section 104(1)(ab)). The relation provisions of associated policy statements, plans and standards are discussed in Section 7 (section 104(1)(b)). There are no other matters considered relevant or necessary under section 104(1)(c)).

Section 105 of the RMA provides for matters that consent authorities must have regard to when considering applications for discharge permits. Effectively, section 105 requires:

- An assessment of the discharges and sensitivity of the environment to adverse effects (section 105(1)(a)).
- The reason for the proposed choice in relation to the discharges (section 105(1)(b)).
- An outline of alternative discharge methods and locations (section 105(1)(c)).

The potential adverse effects on the environment associated with the proposal have been assessed in Section 6 of this document. An overview of consideration of different treatment and the related disposal options is contained in Section 9 of this document. In relation to the preferred option selected, it is considered that it will ensure that the actual and potential effects of the discharges will be avoided, remedied, or mitigated provided the proposed control measures are implemented.

Section 107 of the RMA is also of relevance to the land application of FDE given that contaminants may enter water (i.e., groundwater). Under this section of the RMA, a consent authority shall not grant a discharge permit if the discharge, after reasonable mixing, gives rise to specific effects, identified in section 107(1)(c) to (g), in the receiving environment.

Given that the FDE is applied to land, and not to surface water, the effects that have the potential to occur is in groundwater. Given the mitigation proposed, particularly low application rates, buffer distances to waterways, management of application during time of rainfall and the use of the wintering barns, it is unlikely that the FDE will enter any waterways and result in any effects referred to in section 107. The potential effects of the FDE application on water sourced from groundwater has effectively been assessed in Section 6 of this document and are considered to be less than minor.



## 12.2 Summary

The operation of the proposed activities requires resource consents from Southland Regional Council in order to authorise the use of land as dairy farming, the discharge of FDE to land, variation for the use of two wintering barns, variation to the proposed effluent pond and the taking of groundwater. These activities are collectively considered **discretionary activities** in accordance with the Regional Water Plan, The Proposed Southland Land and Water Plan, the Regional Effluent Application Plan and National Environmental Standard for Freshwater. This application document seeks the required resource consents.

These activities meet the relevant objectives and policies of the identified plans. The grant of this consent is also consistent with Part 2 of the RMA and will allow for the beneficial use of the resources which enables the wider community to provide for its economic, social, and cultural wellbeing.



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## 13 CONCLUSION

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Given the above assessment of effects on the environment, it is considered that it is appropriate to grant, on a **non-notified basis**, for the resource consents sought by Capil Grove Limited under the Resource Management Act 1991. The potential adverse effects of the proposed activities are considered to be less than minor. The proposed activities are not contrary to any of the objectives and policies of the relevant matters set out in Section 104 of the RMA, including the relevant regional plans for the Southland Region.

Overall, it is concluded that the proposal will contribute to the sustainable management of natural and physical resources, while avoiding, remedying, or mitigating any adverse effects on the environment.

The Applicant seeks a consent term of 10 years for all consents because of the less than minor adverse effects. No parties are considered to be adversely affected. The application has been assessed as being consistent with the purpose and principle of the RMA, other relevant provisions of the RMA, regional plans and policy statements and Iwi Management Plan.





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## 14 REFERENCES

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## **15 APPENDICES**

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- Appendix A Farm Maps
- Appendix B Farm Management and Conversion Environment Plan
- Appendix C Effluent Management Plan
- Appendix D Producer Statement and Proposed Pond Design
- Appendix E Dairy Effluent Storage Calculator – Stage 4
- Appendix F Dairy Effluent Storage Calculator – Stage 2
- Appendix G Water Distribution Map



# **Appendix A**

## **Farm Maps**



**LEGEND**

444 Springhills-Tussock Creek Road

**CLIENT**

Capil Grove Limited

**TITLE**

Farm 444 Property Boundary -  
444 Springhills-Tussock Creek  
Road



**STATUS**

<b>SCALE</b>	<b>DATE/TIME</b>
NOT TO SCALE	2021-12-14 16:14
<b>JOB NUMBER</b>	<b>FIGURE NUMBER</b>
10740	N/A
	<b>MAP ID</b>
	204





# **Appendix B**

## **Farm Management and Conversion Environment Plan**

**444 Springhills-Tussock Creek Road**  
**Farm Management & Conversion Environmental**  
**Plan 2021/2022**  
**Environment Southland**

Prepared for

**Capil Grove Ltd**

Prepared by

**L E W E**  
Environmental  
I m p a c t

April 2022




## 444 Springhills-Tussock Creek Road

# Farm Management & Conversion Environmental Plan 2020/2021

## Environment Southland

This report has been prepared for **Capil Grove Ltd** by Low Environmental Impact (LEI). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other parties.

Quality Assurance Statement		
Task	Responsibility	Signature
Project Manager:	Hamish Lowe	
Prepared by:	Victoria Jones	
Reviewed by:	Hamish Lowe	
Approved for Issue by:	Hamish Lowe	
Status:	Draft	

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Date: April 2022



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Appendix A – Farm and paddock boundaries

Appendix B – Physiographic zones

Appendix C – S-map soil, drainage and topoclimate maps

Appendix D – Water bodies; stock crossings, critical source areas, subsurface drainage, setbacks, existing and proposed riparian fencing.

Appendix F – Stage 3 Nutrient Budget: Proposed Dairy Milking with Lease



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# 1 INTRODUCTION

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## 1.1 Purpose

This Farm Environment Management Plan (FEMP) has been prepared for Capil Grove Ltd's (CGL) 444 Farm for the 2021 – 2022 year in accordance with Environment Southland's (ES) Rule 20 – Farming. This is the expected farming operation to be taking place on the property once the related proposed farming application consents are granted (April 2022). The following report as stated in Rule 20 has been prepared in accordance with Appendix N of the Proposed Southland Water and Land Plan. A Conversion Environmental Plan is also required under Environment Southland's (ES) Policy 13A – Transitional policy relating to the establishment of new dairy farms. As the conversion environmental plan and farm environmental plan contain more or less the same information, both have been merged together in this plan to cover all required information.

Any changes made within this farming practice will be documented and this FEMP updated so in the event that ES request such information, this can be readily available. This FEMP should be reviewed annually.

## 1.2 Scope

The following details are recorded in the plan and presented in Section 2:

- Physical address;
- Description of the landholding ownership;
- Owners contact details;
- Legal descriptions of the landholding; and
- A list of all resource consents held and the date of expiry.

The following Maps as outlined in Appendix N of the Proposed Southland Water and Land Plan have been included and are presented in the appendices to this report:

- Appendix A: Farm and paddock boundaries;
- Appendix B: Physiographic zones;
- Appendix C: S-map soil, drainage and topoclimate maps;
- Appendix D: Water bodies; stock crossings, critical source areas, surface drainage, setbacks and riparian planting (existing and proposed)

A nutrient budget has been completed using OverseerFM in accordance with the latest version of Overseer Best Practice Data Input Standards. The nutrient outputs from this modelling are presented in Section 3. Stage three is the expected Stage that will be reached in 2022 as detailed in the related April 2022 application for the proposed farming operation. This is called Stage 3 as the final stage (Stage 4) will not be reached until the lease of sheep to the lessee is finished after 4 years.

Winter grazing management has been described in Section 4. This outlines the winter grazing implemented as well as risks posed to water quality and how these are mitigated. It should be noted that the stock on the sheep lease block are managed by the previous owners (lessees) and not managed by CGL (lessors). The stock management will be at the lessees discretion. The lessees will follow good management practices according to Rule 26 of the National Environmental Standards for Freshwater Regulations 2020, Rule 20 and 25 of the Proposed Southland Water and Land Plan and Rule 17 of the Southland Water Regional Plan for the sheep by the lessees.



Good management practices (GMP) have been listed and described in Section 5. These outline the practices currently implemented and those practices which are to be implemented in the following 12-month period. These include practices for:

- The reduction of sediment and nutrient losses from critical source areas;
- Cultivation;
- The use of land for intensive winter grazing;
- Riparian areas; and
- Minimising the discharge of contaminants to surface water or groundwater.

A specific section for effluent management has not been included in this farm environment & conversion plan as an effluent management plan has already been provided to the council upon this conversion application consent and contains all the required information.



## 2 FARM PROPERTY INFORMATION

### 2.1 General

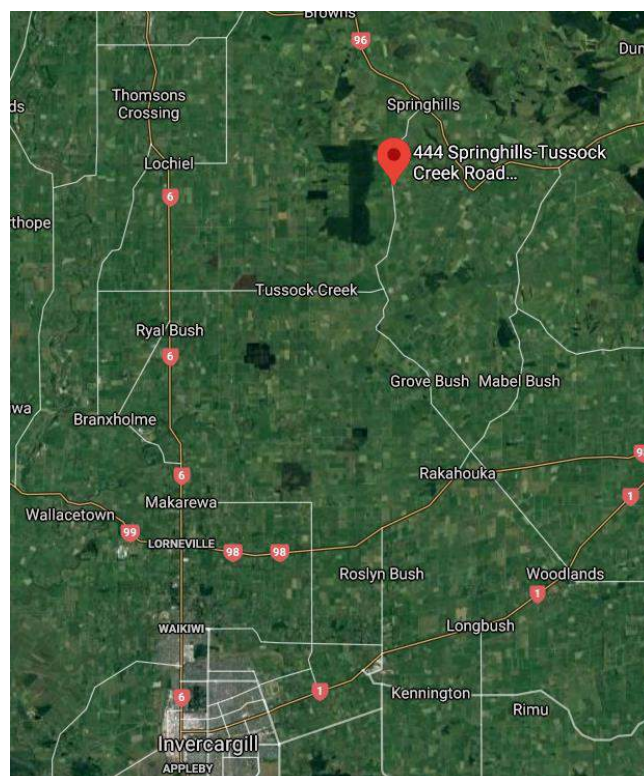
The Lindsay family (Capil Grove Limited) have recently purchased two properties. These include:

- Harwood: Located at 346 Springhills-Tussock Creek Road, Springhills, Southland. This farm was operated as a sheep block with 200 ewes and 200 lambs.
- Hancox: Located at 394 Springhills-Tussock Creek Road, Springhills, Southland. This property operates as a dairy support grazing 400 winter cows on kale and grazing calves on pasture until the second winter.

The applicant also owns three other properties within the surrounding area. These include:

- 444 Farm: Located at 444 Springhills-Tussock Creek Road, Springhills, Southland. The farm has previously been operated as a high intensity sheep block, grazing up to 3,000 breeding ewes, rams, the associated lambs and holding up to 750 hoggets throughout the year. Sheep milking has also previously been carried out on the farm in the past;
- Tuffin: Located at the east of 444 Farm on Sharks Tooth Road. The Tuffin block farmed 430 cattle in an intensive grazing system, with swedes provided as a wintering crop; and
- Sharks Tooth Block: Located to the south east of the property on Sharks Tooth Road farmed the same as Tuffin Block.

The total area of the combined blocks is 340.1 ha (313.4 ha effective). CGL plans to combine all these farms under one dairy milking operation known as 444 Farm. A small portion of the farm is leased back to original owners for sheep grazing. The property is approximately 25 km north of Invercargill. The property is approximately 2.2 km long on a north-west to south-east axis, and about 2.7 km wide. The property location and boundaries are shown in Figure 2.1 and Figure 2.2. A map of the property boundaries and paddocks is provided in **APPENDIX A**.



**Figure 2.1: Property Location**



**Figure 2.2: Property Boundary**

**Table 2.1: Property details for Farm 444.**

	<b>Property Details</b>
<b>Property Name</b>	444 Farm
<b>Physical Address</b>	444 Springhills-Tussock Creek Road, Springhills, Southland;
<b>Property Owner/s</b>	Nelson W and Robyn J Lindsay
<b>Postal Address</b>	27 Capil Road, Grove Bush, 9872
<b>Owner Contact Mobile</b>	0275 200740
<b>Owner Contact Email</b>	nelson@wintonstockfeed.co.nz
<b>Manager Name and Contact (Mobile)</b>	Carl Lindsay (Arlake Limited) 0272031063
<b>Legal Descriptions</b>	Part Lot 2 DP 2005, Lot 1 DP 12811, Section 298 Forest Hill HUN, Lot 2 DP 13790, Lot 1 DP 4795, Section 517 Forest Hill HUN, Lot 3 DP 13790 and Lot 1 DP 13793
<b>Enterprise Type</b>	Dairy Milking
<b>Total area (ha)</b>	340.1 ha
<b>Effective area (ha)</b>	315 ha
<b>List of Resource Consents Held</b>	<ul style="list-style-type: none"> <li>- Consent to use land for dairy support – Auth 20211143-01</li> <li>- A discharge permit to discharge agricultural effluent to land – Auth 20211143-02</li> <li>- Consent for the use of land for the construction, maintenance and use of a new agricultural storage facility – Auth 20211143-03</li> <li>- Consent for the use of a 456 cow wintering barn – Auth 20211143-04</li> </ul> <p>Expired effluent discharge consent – Auth 205665 - expired 2019</p>



## 2.2 Climate

### Rain and Evapotranspiration

Daily rainfall data and daily potential evapotranspiration (PET) data is presented in Table 2.2 below. The nearest climate station with a complete record that covers up-to-date data over a sufficient time span (1997 to 2017) is at Winton 2 (NIWA/5768). The Winton 2 climate station is situated approximately 11.5 km northeast of the 444 Farm. This data is considered the best available to represent the climate at the 444 Farm.

The total rainfall for the area is an average 959 mm per year. The rainfall per month is relatively consistent ranging between 58 mm in August to 98 mm in May. The drier months occur from July to September. Evapotranspiration exceeds rainfall November to February.

**Table 2.2: Monthly average climate data for Winton 1997 -2017.**

Month	Average Rainfall Total (mm)	Average PET (mm) (Total Penman)
January	91	106
February	72	83
March	77	63
April	78	33
May	98	15
June	82	8
July	66	11
August	58	24
September	74	45
October	86	72
November	86	91
December	82	103
Annual	959	653

## 2.3 Physiographic Zones

Southland's physiographic zones give an understanding into the variations in water quality in different areas. Southland has been divided into nine different zones according to factors such as soil type, geology and topography. The physiographic zones present at the 444 Farm are **Gleyed, Peat Wetlands and Bedrock/Hill Country**. An outline of these zones is listed below:

### Gleyed

The majority of the farm is in the gleyed physiographic zone. For the Gleyed zone, soils may accumulate and store nitrogen during summer and early autumn when soil moisture levels are low. Accumulated nitrogen starts moving with water when soils become wet in late autumn and winter and may be lost via artificial drains or overland flow on sloping topography. However, recent science shows there is a low risk of sediment, phosphorus and microbial loss to water on the property. The main contaminant pathway for this zone is artificial drainage.

### Bedrock/Hill Country

The Bedrock/Hill Country Physiographic zone is located in two small areas on the western side of the farm. The Bedrock/Hill Country Physiography zone is land with bedrock or glacial till found near the surface, located below 800m above sea level. There are no significant areas of groundwater. The main contaminant pathways are deep drainage, artificial drainage and overland flow.



## Peat Wetlands

The Peat Wetland Physiographic zone is located in a small section in the north east corner of the farm. The Peat Wetlands Physiographic Zone is formed from rotted remains of wetland plants where there is a naturally high-water table above a poorly permeable rock. Drainage is required to lower the water table to support agriculture as a land use. Phosphorus loss is high as its poorly retained and leaches easily through the soils. Contaminant loss through artificial drainage occurs in high rainfall or when the water table is near the surface. The main contaminant pathways for this physiographic zone are deep drainage, lateral drainage and artificial drainage.

A map of the Physiographic Zones is shown in **APPENDIX B**.

## 2.4 Soils

The soils of the property have been assessed using S-Map. There are two main families of soil: Makarewa and Pukemutu (in association with Braxton soil). These soils are described further in Table 2.3.

The majority of the property is poorly drained and tile drainage has been installed. The S-map soils on this property are shown in **APPENDIX C**.

Appendix C also shows the Topoclimate South Soil map for the 444 Farm for reference and comparison with SMap.

**Table 2.3: S-Map families located over the 444 Farm property**

S-Map Soil	Pukemutu	Makawera	Te Mara	Kuana	Braxton (secondary)
Classification	Perch-Gley Pallic Soil	Typic Orthic Gley	Mottled-Calcareous Orthic Melanic	Lithic Soil	Typic Orthic Gley Soil
Texture	Silt over clay	Silty Clay	Clay	Clay	Silty Loam Over Clay
Potential Rooting Depth	40 - 80 cm	40-90 cm	>100 cm	25-40 cm	Unlimited
Rooting Barrier	Pan	No Significant Barrier within 1 m	No Significant Barrier within 1 m	Massive Rock	Anoxic Conditions
Drainage Class	Poorly Drained	Poorly Drained	Imperfectly Drained	Well Drained	Poorly Drained
Profile Available Water	High (56 mm)	High (164 mm)	Moderate (40 mm)	Low (28 mm)	High (165 mm)
P Retention	22%	30 - 50%	29%	25%	30 -60%
Structure Vulnerability	High	High	Moderate	Low	Moderate
Water Logging Vulnerability	Very high	Very High	Very High	Very High	Very High
Drought Vulnerability	Moderate	Minimal	Moderate	High	Slight
N Leaching Vulnerability	Moderate	Slight	High	Very High	Slight
Relative Runoff Potential	Unknown	High	Unknown	Unknown	High



## **2.5 Water Courses, Stock Crossings, Critical Source Areas, Subsurface Drainage, Setbacks and Riparian Planting.**

The property has watercourses running through it and two man made ponds, which are all fenced off providing a setback from livestock grazing. The property also has an artificial drainage network. These tile drained systems are approximately 100 to 150 mm in diameter and meander through the paddocks to connect to the farm's open drainage system. As this is a recently purchased property, the exact location of the tile drainage system is unknown and is therefore assumed to be in all paddocks except in the steeper Tuffin Block and Shark's Tooth Hill area.

**APPENDIX D** contains two maps which identifies the location of the fenced waterways/setbacks, critical source areas, stock crossing (culvert/bridge) areas, and the location of existing shelter belts, trees and riparian planting on the farm. As the farm has recently been purchased, no new riparian planting is proposed at this stage.

## **2.6 Cropping and Cultivated Land, including Winter Grazed Land**

It is proposed that a maximum of 45 ha of spring grown barley grain which will be sowed in the next 12 months. This will be sown in October and harvested and stored as grain in March before being fed to the dairy cows in the milking shed. As a result, there will be no requirement for grain to be imported onto farm.

All cattle are proposed to be housed in the wintering barn during the winter months and only grazed outside when soil and climatic conditions allow. No winter crops will be grazed on this farm as part of the dairy management or sheep lease block. Any grazing will be in accordance with Rule 20 of the Proposed Southland Land and Water Plan.

The following are the key goals for times when stock are outside of the wintering barn.

- If, after heavy rainfall, there are puddles and water lies in depressions, fence these areas off to prevent livestock access.
- Place any supplementary feed in drier parts of the paddock and well away from critical source areas, place in portable feeder.
- Maximise use of barn facilities during adverse weather conditions.
- Use the documented buffer zones as a minimum, and increase these distances if necessary, to avoid runoff.





## 3 NUTRIENT BUDGET

### 3.1 General

For all landholdings over 20 ha, there is a requirement that FEMP contain a nutrient budget (which includes nutrient losses to the environment) calculated using the latest version of Overseer FM in accordance with the latest version of the Overseer FM Best Practice Data Input Standards (or an alternative model approved by the Chief Executive of Southland Regional Council), and which is repeated:

- (a) where a material change in land use associated with the farming activity occurs (including a change in crop area, crop rotation length, type of crops grown, stocking rate or stock type) at the end of the year in which the change occurs, and also every three years after the change occurs; and
- (b) each time the nutrient budget is repeated all the input data used to prepare it shall be reviewed by or on behalf of the landholding owner, for the purposes of ensuring the nutrient budget accurately reflects the farming system. A record of the input data review shall be kept by the landholding owner.

### 3.2 Results

OverseerFM files were prepared by Lowe Environmental Impact for the 444 farm. The model presented is the likely dairy milking system for this farm (with lease block) and is an accurate representation of the proposed farming system. This was detailed in the related application as "Stage 3".

The lease block that includes the kale will not be managed by the Lindsay's and is managed by the previous owners running sheep. However, as the lease block is part of the property and is proposed to be run under the same farming system once the lease finishes (in the next 4 years), it has been included in the OverseerFM nutrient model. The farm properties were previously a sheep milking operation and intensive beef operation, and a dairy support grazing operation leaching approximately 34 kg N/ha. A consent application for the farming changes has been submitted to council for review.

Table 3.1 below outlines the results of the Overseer modelling for the proposed dairy farming system at 444, including the lease block.

**Table 3.1: OverseerFM results for the 444 farm with the lease block, including the effluent block.**

Area	Kg N/ha	Total N (kg)	Kg P/ha	Total P (kg)
Whole Farm	29	9,907	1.9	646

The inputs and outputs into the Overseer files are attached in **APPENDIX E**. The nutrient losses are the same for the effluent area as the whole farm is anticipated to receive effluent.

There have been no issues identified through the OverseerFM model. The farming system proposed will be leaching much less nitrogen than the previous sheep milking and intensive beef and dairy grazing operations and the same phosphorus losses due to the array of good management practices provided on farm.

The OverseerFM file presented in this FEMP should be updated once actual stock numbers are confirmed and/or when the existing lease block expires and returns to the dairy operation.



## 4 WINTER GRAZING PLAN

### 4.1 Wintering Barn

#### 4.1.1 Wintering system

The cattle will be wintered in a wintering barn over the winter months during rainfall, long periods of wet weather and when soils are saturated. During this time, effluent will be collected and stored in a proposed 17,800 m<sup>3</sup> pond. Silage will be fed to the cows during these times. The expected hours of the animals to be in the barn are shown below in Table 4.1.

**Table 4.1: Average hours cattle are expected to be in the wintering barn over winter.**

Month	Cow Numbers	Approximate Hours Per Day
May	505	16 – 20
June	505	18 – 24
July	505	18 – 24
August	505	16 – 24
September	505	12 – 20

#### 4.1.2 Mitigation of risk to water quality

The wintering barn allows cows to be kept off the soil in periods when the soil is saturated, rainfall is heavy or during long rainfall durations. Consequently, this eliminates the chance of pugging where the soil structure can be damaged, and soils become susceptible to leaching and runoff.

Feeding silage in the barn versus on the pasture also reduces the chance of damaged soils as cattle will move to an area where the feed is located, increasing the number of animals in that set area which also increases nutrient losses.

Capturing effluent during the winter months provides an opportunity to apply effluent when plant requirements are at their highest and soils are not saturated. CGL have applied for a 17,800 m<sup>3</sup> effluent pond which is more than enough storage to hold effluent from May through to September if soil temperatures are low, or saturated and/ or rainfall is high which increases the chances of leaching and runoff. If the pond was smaller, there could be a requirement to apply effluent during times when it had been raining or temperatures were cold to avoid risk of effluent pond overflow. This avoids that risk and also provides flexibility in managing the effluent to meet plant demands, where fertiliser would otherwise be used.

### 4.2 Winter grazing

There will be no intensive winter grazing done by the dairy cows. There is expected to be some winter grazing of kale by sheep on the lease block in the months of June, July and August, however the previous owners will be managing this and will ensure that it is managed as a permitted activity under Rule 26 of the National Environmental Standards for Freshwater Regulations 2020, Rule 20 and 25 of the Proposed Southland Water and Land Plan and Rule 17 of the Southland Water Regional Plan. This includes setbacks from the waterways by an electric fence, and only sowing 8 ha of kale which is approximately 2% of the total farm area.



## 5 GOOD MANAGEMENT PRACTICES

### 5.1 General

The following outlines the good management practices that have been implemented and indicates the good management practices which will be undertaken over the coming 12-month period.

### 5.2 Critical Source Areas

GMP	Currently Implemented	To Be Implemented in the next 12-months	Action to be taken
Identify risk of overland flow of sediment and nutrients on the property and implement measures to minimise transport of these to waterbodies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Avoid pugging and compaction of soil (be vigilant in wet weather)
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Locate any supplementary feed out areas when stock are grazing away from waterways
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Keep a good ground cover and minimise time paddocks are out of grass (regrassing)
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Capture all runoff from hard surfaces (use sediment traps, apron/bunded area around feed pad/milking shed, silage pits)

Comments:

- Household and farm rubbish is collected and removed off farm
- Wintering barn effluent and milking shed effluent is collected, stored and managed appropriately as described in the consent application.
- Silage pits to be correctly lined and leachate managed. Leachate will be collected and contribute to the effluent storage pond.
- Offal pit to be installed in appropriate permitted location.

### 5.3 Cultivation

GMP	Currently Implemented	To Be Implemented in the next 12-months	Action to be taken
Preventing soil damage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Minimising grazing time of pasture (minimal hours/day)
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Only grazing when soil moisture is below field capacity
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Harvest pasture when soil conditions are appropriate for heavy machinery
Manage periods of exposed soil between crops/pasture to reduce risk of erosion, overland flow and leaching	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Areas that are harvested, grazed or stock damaged are resown as soon as practical to minimise periods of exposed soil.
Reduce loss of sediment and nutrients through cultivation methods	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Re-sow bare paddocks as soon as practical



Comments:

- There will be no cultivation of crops that will be grazed-in-situ by cows over the winter.
- Barley will be direct sown in late October to reduce soil damage. The grain will be harvested in March and stored for feed in the milking shed.

## 5.4 Winter Grazing

GMP	Currently Implemented	To Be Implemented in the next 12-months	Action to be taken
Use appropriate paddocks for any winter grazing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Monitor soil moisture/ avoid paddocks that are easily pugged during winter
Manage grazing to minimise nutrient loss from risk areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Graze high risk or areas close to waterways last (leave at least a 20 m buffer to waterways)
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Supplementary feed is fed in portable feeders, not directly on the ground and located away from waterways

While no intensive winter grazing will occur on this farm by the cows, good management practices will be followed according to Rule 26 of the National Environmental Standards for Freshwater Regulations 2020, Rule 20 and 25 of the Proposed Southland Water and Land Plan and Rule 17 of the Southland Water Regional Plan for the sheep by the lessees.

If intensive winter grazing occurs by the cows, the above listed actions will occur, along with:

- Mob size is <120 cows when being winter grazed
- If the area to be grazed is located on sloping ground, stock are progressively grazed (break-fed or block-fed) from the top of the slope to the bottom, or a 20 metre 'last-bite' strip is left at the base of the slope;
- Back fence when break or block feeding to prevent stock from entering previously grazed areas
- Transportable water troughs are used to avoid stock accessing waterways, and to assist with back fencing management
- Move fences daily and offer long, narrow breaks rather than short wide breaks



## 5.5 Riparian Areas

Plan and prioritise waterways to fence, based on vulnerability of the land and significance of the waterway. Stock exclusion from water bodies is mandatory by 1 July 2020 (Rule 70 Proposed Land and Water Plan).

GMP	Currently Implemented	To Be Implemented in the next 12-months	Action to be taken
Reduce contaminants and nutrients entering waterways	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Undertake a riparian management plan
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maintain at least a 5 metre buffer strip from waterways (grazing) and 20m buffer when applying effluent
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plant out riparian areas as per RMP
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maintain plantings and control weeds using weeding and spraying
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ensure drains are kept clear and managed
Exclude stock from waterways	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fence all permanently flowing waterways and regularly maintain (including wetlands)
Areas of native plants or significant biodiversity are protected	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Control weeds
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Trap or poison animal pests



## 5.6 Contaminants and Water

GMP	Currently Implemented	To Be Implemented in the next 12-months	Action to be taken
Monitor soil nitrogen and phosphorus levels at or below agronomic optimum for the farm system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Do not fertilise buffer zones besides waterways
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ensure fertiliser spreading equipment is calibrated and maintained
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Water use monitored and leaks fixed as soon as possible
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FDE system meets code of practice
Water use is efficient	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sufficient suitable storage available
Understand and comply with FDE consent conditions and regional rules	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Comply with all conditions set on discharge consents and effluent management plan
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Effluent system is regularly checked, serviced and maintained.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Discharge of contaminants is set at appropriate depth to minimise contaminants entering ground or surface water
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Risk of leachate from silage pits identified and managed – aprons and bunds used.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Offal pit is located in an area where there is no risk of contamination of ground or surface water
Farm runoff contained and farm waste is minimised and managed appropriately	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Farm rubbish recycled where possible, removed off farm and/or dump located in an area where there is no risk of contamination of ground or surface water



## 5.7 Other

GMP	Currently Implemented	To Be Implemented in the next 12-months/On-going	Action to be taken
Ensure Accurate and Auditable Records are Kept	☒	☐	Maintain farm records, including supplementary feed, fertiliser use and location of application, stock numbers
	☒	☐	Keep Farm Environmental Plan updated



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## **6 APPENDICES**

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Appendix A – Farm and paddock boundaries

Appendix B – Physiographic zones

Appendix C – S-map soil, drainage and topoclimate maps

Appendix D – Water bodies; stock crossings, critical source areas, subsurface drainage, setbacks, existing and proposed riparian fencing.

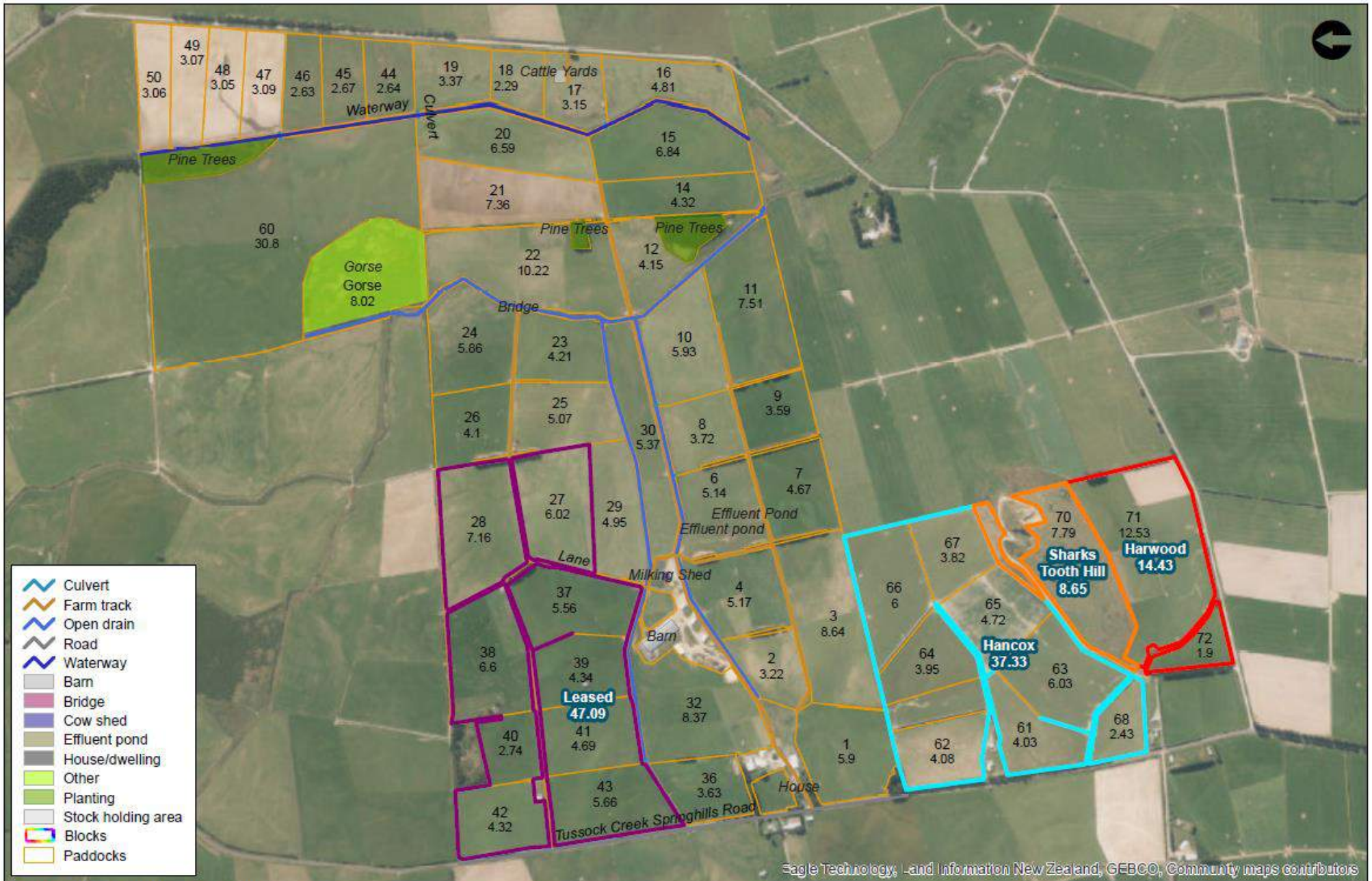
Appendix F – Stage 3 Nutrient Budget: Proposed Dairy Milking with Lease



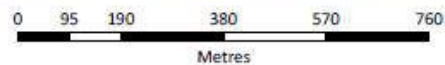


# **APPENDIX A**

## **Farm and Paddock Boundaries**



Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors





# **APPENDIX B**

## **Physiographic Zones**

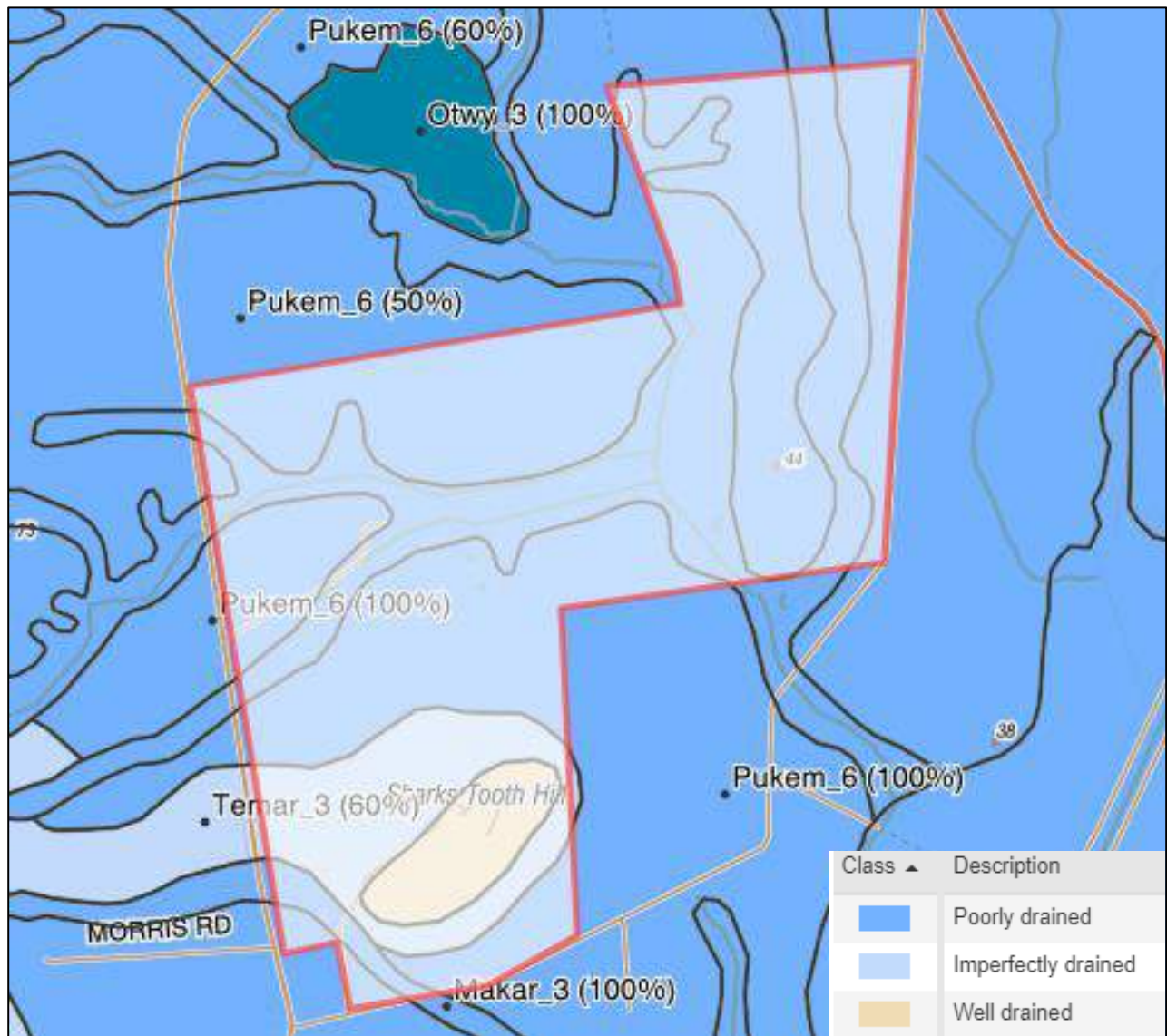


**Physiographic Zones at 444 Farm**



# **APPENDIX C**

## **S-Map Soil and Topoclimate Maps**

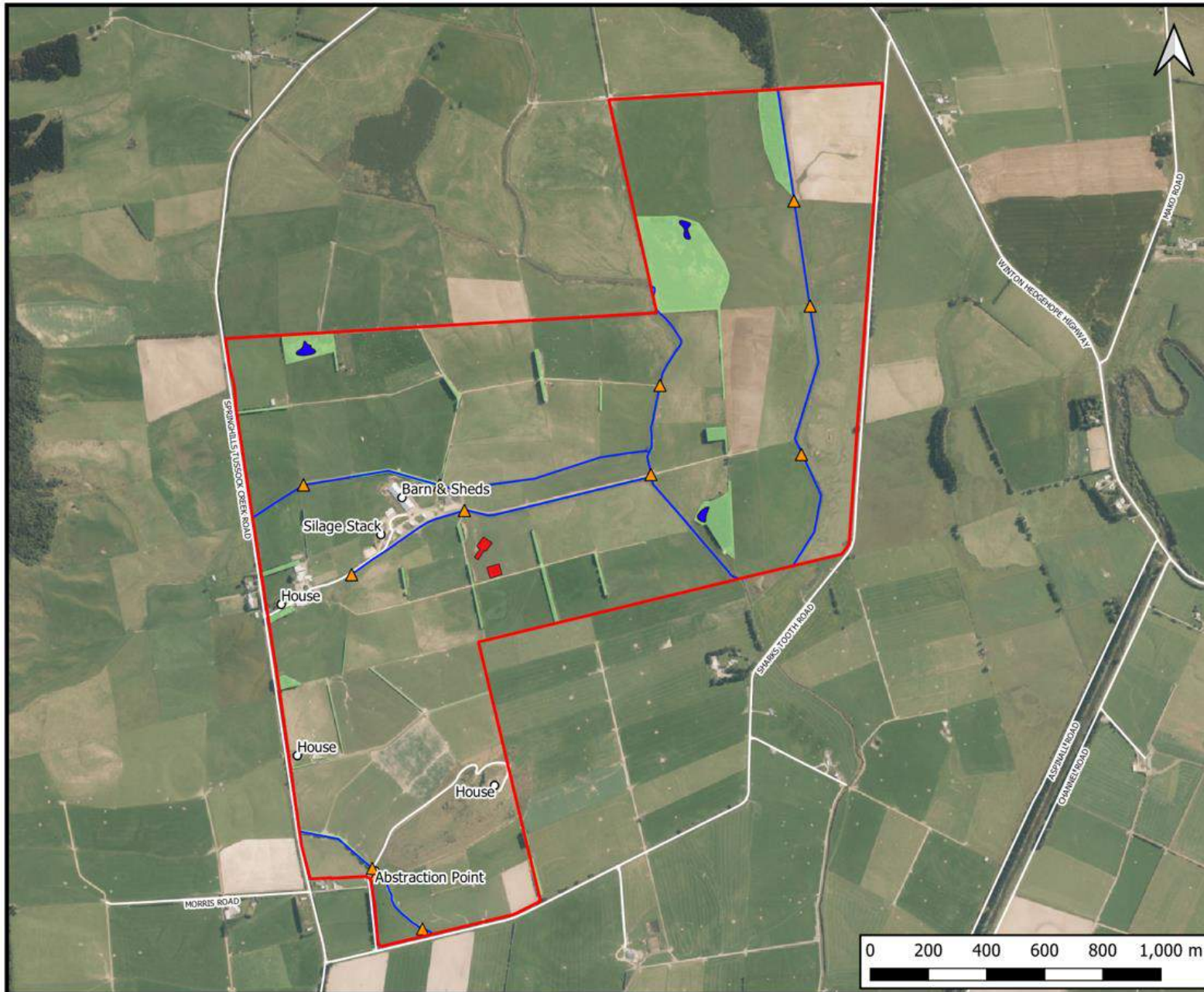


**Soil Types and Drainage Class at 444 Farm**



# **APPENDIX D**

## **Fenced Water Courses, Stock Crossings, Critical Source Areas Shelter Belts and Riparian Planting**



**LEGEND**

- 444 Springhills-Tussock Creek Road
- ▲ Stock Crossings
- Fenced Waterways
- Effluent Ponds
- Ponds
- Shelter Belts, Trees and/or Riparian Planting

**CLIENT**

Capil Grove Limited

**TITLE**

Site Feature Map



**STATUS**

<b>SCALE</b> NOT TO SCALE	<b>DATE/TIME</b> 2021-12-15 16:10
<b>JOB NUMBER</b> 10740	<b>FIGURE NUMBER</b> N/A
	<b>MAP ID</b> 213







## **APPENDIX E**

### **Stage 3 Nutrient Budget: Proposed Dairy Milking with Lease**

# OVERSEER

## FARM SUMMARY REPORT

Printed date: 22 Mar 2022, 12:39PM

Printed by: Low Environmental Impact



31857

135 Capil Rd, Grove Bush 9872, New Zealand

### Stage 3 - Proposed Dairy Milking w/ lease

Analysis type	Scenario
Model version	6.4.2

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## FARM MAP



## GREENHOUSE GAS EMISSIONS

	PROPOSED DAIRYMILKING W/ LEASE
Total GHG emissions (eCO <sub>2</sub> /tonnes/yr)	4,922.5
Methane (eCO <sub>2</sub> /tonnes/yr)	3,698.5
N <sub>2</sub> O (eCO <sub>2</sub> /tonnes/yr)	525.6
CO <sub>2</sub> (eCO <sub>2</sub> /tonnes/yr)	698.4

## eCO<sub>2</sub> FOOTPRINT

	PROPOSED DAIRYMILKING W/ LEASE
Dairy (kg/cow)	8,834
Sheep (kg/SU)	397
Dairy grazing (kg/SU)	442
Vegetable/arable crops (kg/ha)	763

## NUTRIENTS

		PROPOSED DAIRYMILKING W/ LEASE
Nitrogen	Total loss (kg)	9,907
	Loss/ha (kg/ha)	29
	NCE (%)	29
	N Surplus (kg/ha)	182
Phosphorus	Total loss (kg)	646
	Loss/ha (kg/ha)	19
	P Surplus (kg/ha)	25

## NITROGEN

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the N surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.

$$\begin{array}{|c|} \hline \text{ADDITIONS} \\ \hline 258 \text{ kg/ha} \\ \hline \end{array}
 -
 \begin{array}{|c|} \hline \text{PRODUCTS} \\ \hline 81 \text{ kg/ha} \\ \hline \end{array}
 =
 \begin{array}{|c|} \hline \text{TRANSFERS} \\ \hline 75 \text{ kg/ha} \\ \hline \end{array}
 +
 \begin{array}{|c|} \hline \text{LOSS TO AIR} \\ \hline 72 \text{ kg/ha} \\ \hline \end{array}
 +
 \begin{array}{|c|} \hline \text{OTHER LOSSES} \\ \hline 29 \text{ kg/ha} \\ \hline \end{array}$$

1 - Nitrogen surplus is total additions minus product removed (177 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

### NITROGEN BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		PROPOSED DAIRYMILKING W/ LEASE
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent <sup>1</sup>	95
Rain/clover fixation	Nutrients from rainfall and fixation of atmospheric nitrogen by legumes/clover.	77
Supplements	Nutrients from supplements imported onto the farm.	86
Total		258

### NITROGEN REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		PROPOSED DAIRYMILKING W/ LEASE
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	75
As supplements and crop residues	Nutrients removed in supplements and crop residue exported off farm.	6
Total		81

## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/ from storage.

		PROPOSED DAIRYMILKING W/ LEASE
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	54
Inorganic soil pool	Change in plant available nutrients based on soil tests.	37
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	14
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-30
<b>Total</b>		<b>75</b>

## NITROGEN LOST TO THE ATMOSPHERE

The nutrients lost into the atmosphere through volatilisation and denitrification.

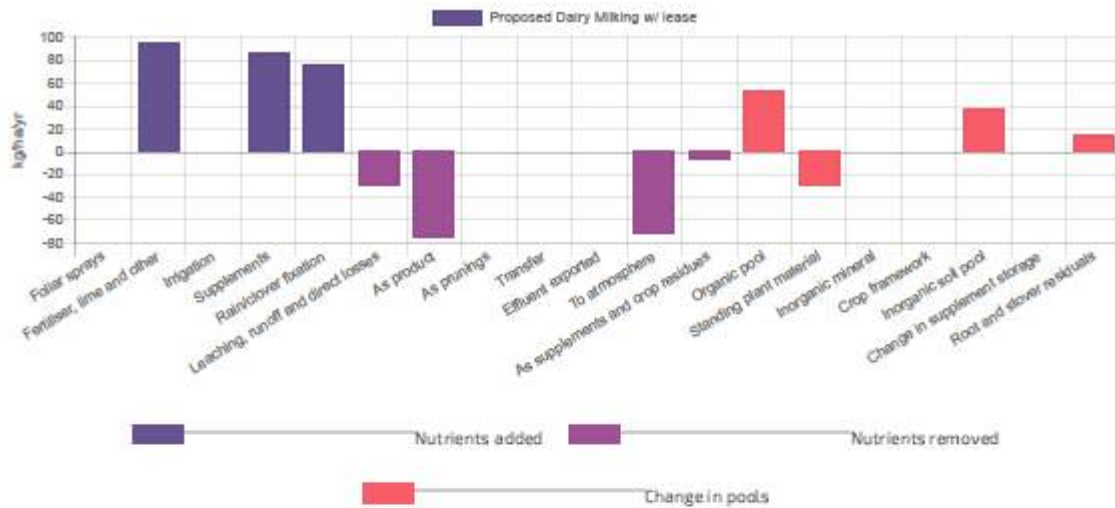
		PROPOSED DAIRYMILKING W/ LEASE
Denitrification - background	Background conversion of nitrate to nitrogen gas.	9
Volatilisation - other	Background loss of nitrogen to the atmosphere as ammonia.	25
Volatilisation - urine	Loss of nitrogen in urine to the atmosphere as ammonia.	25
Denitrification - urine	Conversion of nitrate from urine to nitrogen gas.	10
Volatilisation - fertiliser	Loss of nitrogen in fertiliser to the atmosphere as ammonia.	3
<b>Total</b>		<b>72</b>

## OTHER NITROGEN LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

		PROPOSED DAIRYMILKING W/ LEASE
Leaching - urine patches	Nutrients from urine that has leached below the root zone.	5
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	20
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	4
<b>Total</b>		<b>29</b>

## NITROGEN MOVEMENTS



## PHOSPHORUS

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the P surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Phosphorus surplus is total additions minus product removed (25 kg/ha)

2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

### PHOSPHORUS BROUGHT ONTO FARM

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

		PROPOSED DAIRYMILKING W/ LEASE
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.	25
Supplements	Nutrients from supplements imported onto the farm.	14
<b>Total</b>		<b>39</b>

### PHOSPHORUS REMOVED AS PRODUCT

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

		PROPOSED DAIRYMILKING W/ LEASE
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	14
<b>Total</b>		<b>14</b>

## TRANSFER OF NUTRIENTS

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/ from storage.

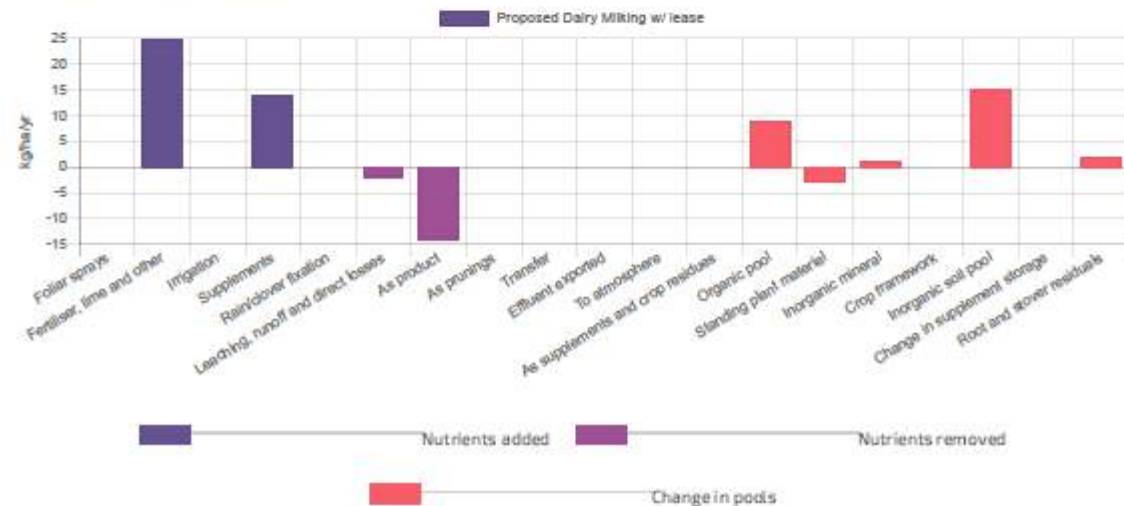
		PROPOSED DAIRYMILKING W/ LEASE
Inorganic mineral	Nutrients adsorbed on (adhered to) clay minerals and undissolved lime.	1
Organic pool	Mineralisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised the number is negative.	9
Inorganic soil pool	Change in plant available nutrients based on soil tests.	15
Root and stover residuals	Difference in nutrient amount between the beginning and end of the year in stolons and roots added as residue.	2
Standing plant material	Difference in nutrient amount between the beginning and end of the year in the standing crop.	-3
Total		24

## OTHER PHOSPHORUS LOST FROM THE FARM

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

		PROPOSED DAIRYMILKING W/ LEASE
Runoff	Nutrients losses during runoff (over land).	1.4
Direct (animals, drains)	Nutrients to water via drainage systems or directly from animals.	0.3
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	0.2
Total		1.9

## PHOSPHORUS MOVEMENTS



## PHYSICAL CHARACTERISTICS

		PROPOSED DAIRYMILKING W/ LEASE
Land area	Farm area (ha)	340.1
	Productive block area (ha)	313.4
Climate	Average temperature (°C)	10.3
	Average rainfall (mm)	1,110
	Average PET (mm)	719

## FARM SOILS

		PROPOSED DAIRYMILKING W/ LEASE
Recent/YGE/BGE/Pallic Pukem_6a.1	Area (ha)	191
	Properties modified	-
Sedimentary/Gley Brax_4a.1	Area (ha)	6.6
	Properties modified	-
Sedimentary/Gley Makar_3b.1	Area (ha)	82.4
	Properties modified	-
Sedimentary/Melanic Kau_7a.1	Area (ha)	8.7
	Properties modified	-
Sedimentary/Melanic Temar_3a.1	Area (ha)	24.7
	Properties modified	-

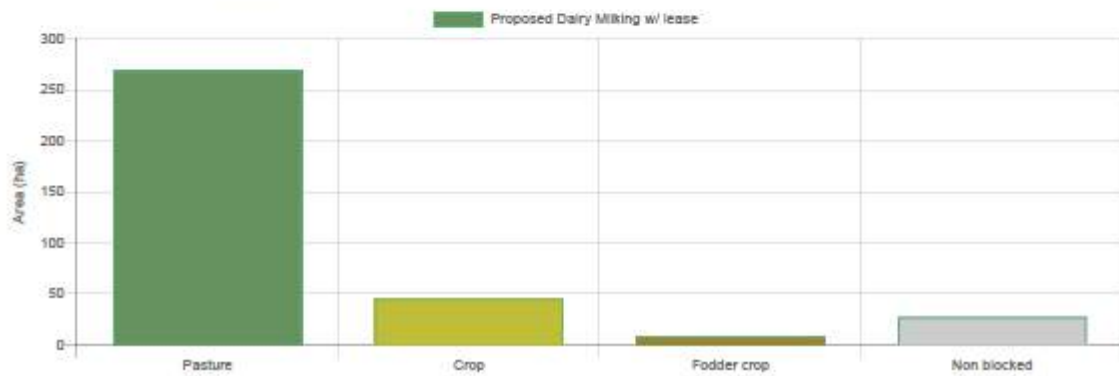
1 - Olsen P is calculated using soil test results, proportioned by the area of the farm that this soil covers.



## BLOCK TYPES

		PROPOSED DAIRY MILKING W/ LEASE
Pasture	Area (ha)	268
	Pasture grown (T/DM/Yr)	3,349
	Pasture intake (T/DM/Yr)	2,163
	Supplements harvested (T/DM/Yr)	650
Crop	Area (ha)	45
	Pasture grown (T/DM/Yr)	142
	Pasture intake (T/DM/Yr)	121
Fodder crop	Area (ha)	8
Non blocked	Area (ha)	27
Total area	(ha)	340

## EFFECTIVE AREA BY BLOCK TYPE



## DRAINAGE

- Drainage indicates the amount of water draining below the root zone of typical crops or pastures (60cm). Drainage occurs when the amount of water (from rainfall and irrigation) exceeds the water holding capacity of the soil. When water drains it can take any excess nitrogen below this root zone and so risks leaching from the farm into the water table below.

The model uses a 30 year average climate for each block's location. The following graph shows the percentage of annual drainage that occurs each month using this average climate. This provides an indication of when the highest leaching risk is for the farm when under average conditions.

		PROPOSED DAIRYMILKING W/ LEASE
Drainage	Average drainage at 60cm (mm)	-
	Nitrogen concentration in water drained (ppm)	-

### WHEN DRAINAGE AT 60CM OCCURS



### WETLANDS & ARTIFICIAL DRAINAGE SYSTEMS

		PROPOSED DAIRYMILKING W/ LEASE
Mole tile drainage	Area (ha)	268.7

### CROPS

		PROPOSED DAIRYMILKING W/ LEASE
Ryegrass/white clover	Area (ha)	260.4
	Pasture grown (T/DM/Yr)	3,228
	Pasture intake (T/DM/Yr)	2,078
	Supplements (T/DM/Yr)	650
Barley (spring)	Area (ha)	45
	Yield (T grain)	360
Kale	Area (ha)	8
	Yield (T dry matter)	96

## ANIMALS

		PROPOSED DAIRYMILKING W/ LEASE
RSU	Total RSU (RSU)	7,313
	RSU per farm area (RSU)	21.5
	RSU per productive area (RSU)	23.33
Production	Total liveweight brought (kg/ha grazed)	1,002
	Total liveweight reared (kg/ha grazed)	140
	Total liveweight sold (kg/ha grazed)	1,077
	Milk production per cow (kg milk solids / cow)	550
	Milk solids (kg/ha grazed)	1,035
	Milking herd size (peak cows/ha grazed)	19

## ENTERPRISE RSU

		PROPOSED DAIRYMILKING W/ LEASE
Dairy grazing	Total RSU (RSU)	247
	RSU per farm area (RSU/ha)	0.73
	RSU per grazed area (RSU/ha)	0.92
Dairy	Total RSU (RSU)	6,207
	RSU per farm area (RSU/ha)	18.25
	RSU per grazed area (RSU/ha)	23.13
Sheep	Total RSU (RSU)	859
	RSU per farm area (RSU/ha)	2.53
	RSU per grazed area (RSU/ha)	3.2

## ENTERPRISE RSU BY MONTH

### ALL ENTERPRISES (RSU)



### DAIRY GRAZING (RSU)



### DAIRY (RSU)



### SHEEP (RSU)



### ENTERPRISE STOCK NUMBERS BY MONTH

#### DAIRY GRAZING (COUNT)



#### DAIRY (COUNT)



#### SHEEP (COUNT)



## STRUCTURES

		PROPOSED DAIRY MILKING W/ LEASE
Covered wintering pad/shelter - Dairy	RSU on structure (RSU)	2,125

## STRUCTURE RSU BY MONTH

### COVERED WINTERING PAD/SHELTER - DAIRY

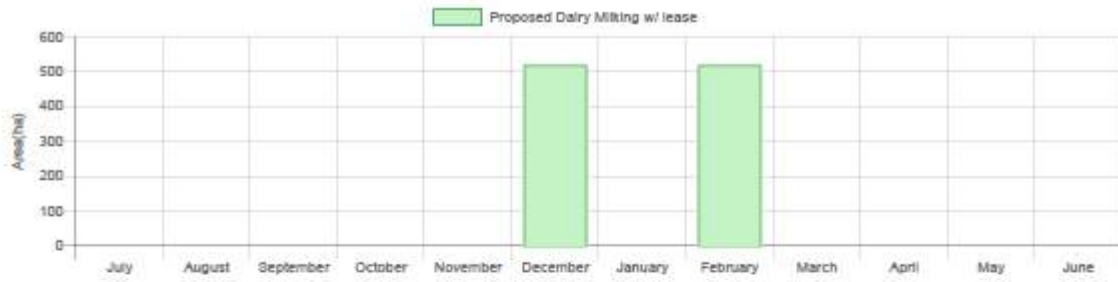


## EFFLUENT

		PROPOSED DAIRY MILKING W/ LEASE
Area receiving liquid	Total area (ha)	297
	Pastoral area receiving liquid (ha)	252
	% of farm pastoral area (%)	97
	Average liquid effluent (N/ha/yr)	49
Source of N in effluent blocks	Average fertiliser (N/ha/yr)	100
	Average other (N/ha/yr)	22
	Effluent from farm dairy (%)	27
	Effluent from Uncovered wintering pad/shelter (%)	49
Area of farm to apply all effluent to achieve rates of	Solids (%)	24
	150 kg N/ha/yr - Liquid (ha)	103
	150 kg N/ha/yr - Solid (ha)	37
	150 kg N/ha/yr - Total (ha)	140
	Maintenance K (ha)	901
	100 kg K/ha/yr (ha)	270

## EFFLUENT SOLIDS BY MONTH

### SOLIDS APPLICATION AREA BY MONTH



## FEED

		PROPOSED DAIRY MILKING W/ LEASE
RSU	Total (RSU)	7,163
	Pasture (RSU)	3,954
	Farm supplements (RSU)	887
	Imported other supplements (RSU)	1,538
	Imported fodder supplements (RSU)	673
	Crops (RSU)	111

## RSU - DAIRY GRAZING

		PROPOSED DAIRY MILKING W/ LEASE
	Total (RSU)	247
	Pasture (RSU)	247

## RSU - DAIRY

		PROPOSED DAIRY MILKING W/ LEASE
	Total (RSU)	6,060
	Pasture (RSU)	2,962
	Farm supplements (RSU)	887
	Imported other supplements (RSU)	1,538
	Imported fodder supplements (RSU)	673

## RSU - SHEEP

		PROPOSED DAIRY MILKING W/ LEASE
	Total (RSU)	856
	Pasture (RSU)	745
	Crops (RSU)	111

## FERTILISER

		PROPOSED DAIRYMILKING W/ LEASE
Synthetic N	Crop (kg)	5,310
	Crop (kg/ha)	118
Synthetic N	Fodder crop (kg)	1,360
	Fodder crop (kg/ha)	170
Synthetic N	Pasture (kg)	25,820.1
	Pasture (kg/ha)	99
Synthetic P	Crop (kg)	1,350
	Crop (kg/ha)	30
Synthetic P	Fodder crop (kg)	288
	Fodder crop (kg/ha)	36
Synthetic P	Pasture (kg)	6,926.8
	Pasture (kg/ha)	27

## FERTILISER NUTRIENTS BY MONTH

### N (KG)



### P (KG)



### S (KG)



 The selected analysis does not contain irrigation information



# **Appendix C**

## **Effluent Management Plan**



# Farm 444 Effluent Management Plan

Prepared for

**Capil Grove Limited**

Prepared by

**L W E**  
Environmental  
I m p a c t



April 2022



# Farm 444 Effluent Management Plan

## Capil Grove Limited

This report has been prepared for **Capil Grove Limited** by Lowe Environmental Impact (LEI). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other parties.

Quality Assurance Statement		
Task	Responsibility	Signature
Project Manager:		
Prepared by:	Victoria Jones	
Reviewed by:		
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Ref: Farm\_444\_Effluent\_Management\_Plan-  
220103-VJ

Job No.: 10740

Date: April 2022



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Appendix B – Soil Factsheets

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Appendix D – Effluent Location Recording Sheet

Appendix E – Staff Training Checklist

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# 1 BACKGROUND

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## 1.1 Introduction

This Farm Effluent Management Plan has been prepared for Capil Grove Limited (CGL) 444 Farm to ensure the effective management of farm dairy effluent on the property. It has been drafted to reflect current good management practices and sets out how the effluent system will be operated to achieve these. Farm dairy effluent is an important fertiliser resource, which if utilised correctly results in nutrients being returned to the soil and used by plants for pasture growth. This has significant environmental and economic benefits.

## 1.2 Location

The property is located in Southland at 444 Springhills - Tussock Creek Road, Springhills and the total farm area is 340.1 ha.

## 1.3 General Farm Information

The farm will initially be run as a dairy support block with up to 220 cows from May to September. After a dairy conversion consent is granted, CGL plan to keep the dairy support cows on the property and milk them following calving. After a new 17,800 m<sup>3</sup> effluent pond and new winter barn is installed, they will milk up to 505 cows. The Lindsay's are currently leasing out 50 ha of the property, so following the finish of this lease (a four year period), up to 640 cows will be milked.

Cows are milked year round and will be housed in two wintering barns when soil and climatic conditions are unsuitable for grazing. The effective area of the farm is 313.4 ha. The topography of the effluent irrigation area is flat to rolling slopes with tile drains present in most paddocks. The effluent area is within the Gleyed (Overland flow variant), Peat Wetlands and Bedrock Hill Country physiographic zones and is located on the following soil types:

### a) Pukemutu Soils (+ Braxton)

They are formed in deep loess derived from tuffaceous greywacke. They have heavy silt loam, grading with depth to silty clay, textures and are poorly drained, with a dense fragipan between 60 and 90cm depth which restricts water drainage. They respond well to mole and tile drainage and are used for intensive sheep, dairy and deer production, with some cropping.

Associated with the Pukemutu soil is Braxton soils, which are moderately deep to deep Gley soil on terraces with heavy silt loam to clayey textures; has no perch-gley properties or fragipan within 90cm depth.

### b) Makarewa Soils

Makarewa soils are formed from fine alluvium from a range of sources and are moderately deep, poorly drained soils. These soils have silty clay textures and are typically stone free.

For both the above soil types: Care needs to be taken during heavy rain and prolonged wet periods to prevent waterlogging and compaction. Intensive stocking, cultivation and heavy vehicular traffic use should be minimised during these periods. Due to the very slow subsoil permeability and poor drainage these soils only



have a slight vulnerability to nutrient leaching, however they are often artificially drained via tile and mole drains which increases their vulnerability to nutrient loss.

Full details of the soils listed above can be found in Appendix B. More detailed information on specific farm procedures and systems will be covered in Sections 2 and 3 below.



## 2 EFFLUENT MANAGEMENT SYSTEM

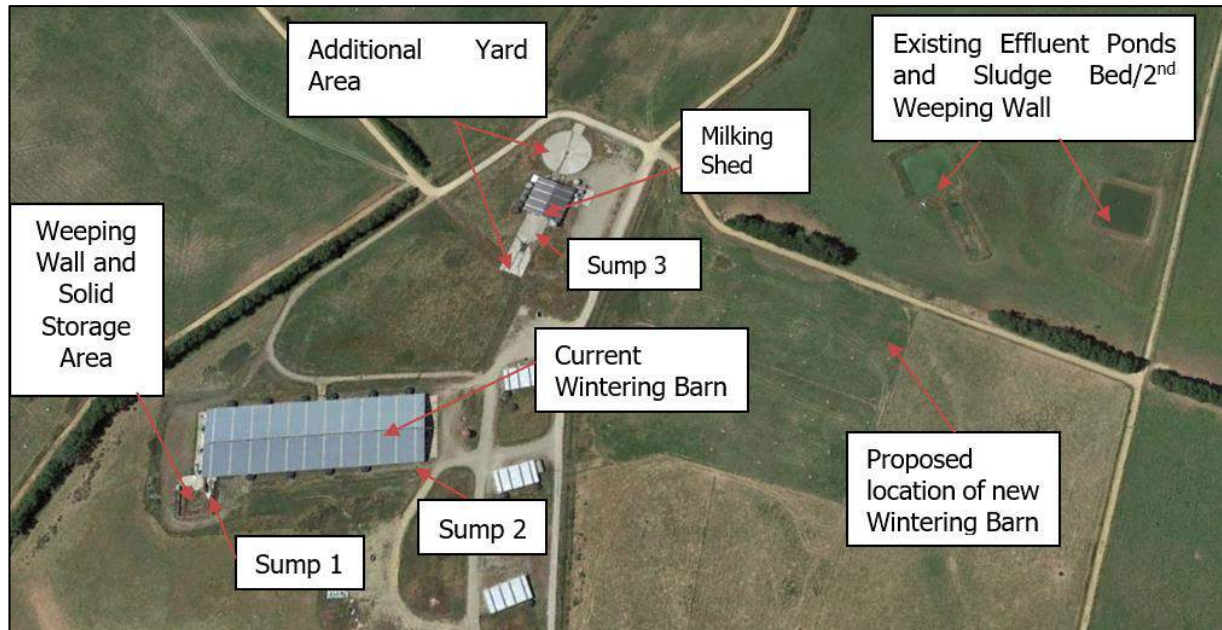


Figure 2.1: Overview of layout showing barn and effluent treatment system at 444.

The system configuration is as follows:

1. Effluent generated from the current wintering barn (4,590 m<sup>2</sup>) is scraped using a chain scraper into a strip drain at north east end of the barn (Figure 2.2). The barn to be constructed will work in a similar fashion.

2. There is a conveyor chain that will take the effluent from the chain scraper through to the weeping wall (Picture 2.3) and associated solid storage area (288 m<sup>2</sup>) (Picture 2.4). This weeping wall is above ground level and has a drain around the outside that flows the liquid effluent into a sump (Sump1) (Picture 2.5).

There is also another sump (Sump 2) at the other end of the barn to capture any additional liquid that runs out of the barn (Picture 2.6).

3. The effluent from an additional stock holding yard area (420 m<sup>2</sup>) that is occasionally washed down, flows into a nearby transfer sump (Sump 3)

4. Effluent from these transfer sumps are then pumped and through to the 2nd weeping wall/sludge bed, where liquids flow via gravity to effluent Pond 1 (923 m<sup>3</sup>). Effluent can also be pumped directly to the new proposed 17,800 m<sup>3</sup> pond. Effluent from Pond 1 can either be pumped to the irrigator or directed to effluent pond 2 (881 m<sup>3</sup>) (Pictures 2.7 and 2.8).

5. Effluent from effluent Pond 2 is then either pumped or gravity fed back to effluent Pond 1 where it can be irrigated to pasture.

6. During suitable conditions effluent is irrigated from the effluent ponds by K-line-Max70 pods. The pods are fitted with an electronic failsafe to automatically shut down the pump if there is a sudden pressure drop or increase.

7. The farm will also occasionally use a slurry tanker/muck spreader to discharge effluent via the slurry tanker located on the property (See Section 3.7).



8. Solid Effluent from the wintering barn and associated weeping wall is spread to land in accordance with Section 3.8 of this plan.



Figure 2.2: Chain scarpers within wintering barn.



Figure 2.3: Conveyor chain and weeping wall.



Figure 2.4: Weeping wall and solid storage area.



Figure 2.5: Transfer sump 1 at north-east corner of barn.





Figure 2.6: Transfer sump 2.



Figure 2.7: Effluent pond.

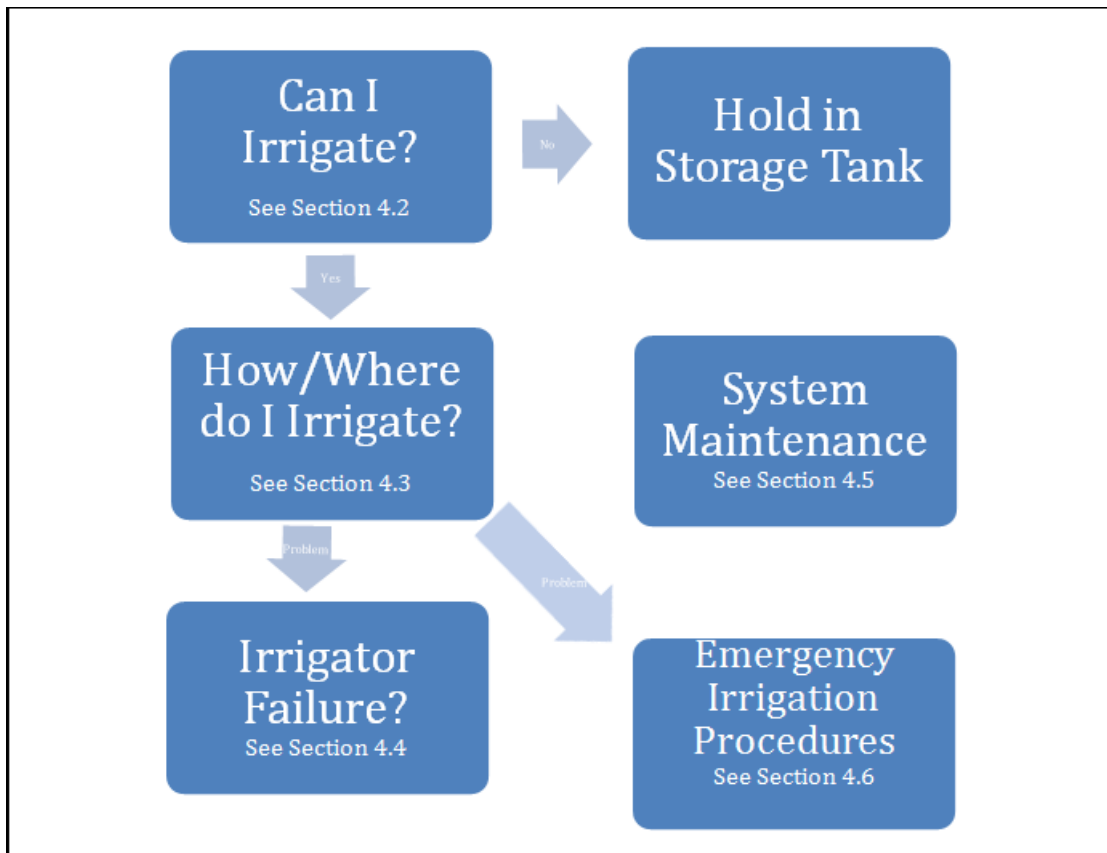


**Figure 2.8: Aerial view of existing effluent ponds, weeping wall/sludge bed**



### 3 EFFLUENT SYSTEM OPERATION

#### 3.1 Can I Irrigate?



**Figure 3.1: Chart to determine occurrence of irrigation.**

- 1) Check the level of effluent in the effluent pond, is there a risk of it overflowing? Effluent must be discharged if this is the case by following the emergency procedures outlined in Section 3.5.
- 2) Check soil moisture levels and for significant soil cracking. A 2.5 mm soil moisture deficit needs to exist before the pods can be operated for one hour. If effluent is to be applied for 2 hours without moving the pods a 5 mm soil moisture deficit is required.
- 3) A guide to whether irrigation can be undertaken can be obtained from the closest Environment Southland soil moisture monitoring site (with a similar soil type) located at Tussock Creek. If this is not red then conditions may be suitable for irrigation. Soil Moisture can be tested on farm using a soil moisture probe or alternatively refer to the Environment Southland Website [www.es.govt.nz](http://www.es.govt.nz) and click on Beacon/soil moisture.
- 4) If soil moisture conditions are **unsuitable** or heavy rain is likely, effluent will be held in the effluent pond until conditions are suitable.
- 5) If soil moisture conditions are **suitable** effluent irrigation will occur in accordance with Section 3.2. Check wind conditions to ensure that effluent can be discharged without resulting in spray drift and odour beyond the boundary of the property.



### **3.2 How/ Where Do I Irrigate?**

- 1) Assuming weather and soil moisture conditions are suitable for irrigation the K-Line max 70 will be set up in a suitable paddock, observing 20 m setbacks from waterways, the property boundary, and the consented discharge areas (Appendix C). A visual inspection of the paddock will be made and this paddock shall only be used for effluent application if there are no visible danger signs. Such signs include surface water, pugging, wheel ruts, stock grazing, soil cracking, etc. Select another paddock if any of these conditions exist. Avoid irrigating over tile drains, soil cracks (dry conditions) and paddock low points, especially in wet weather (See Appendix A for map).
- 2) The pods will be set up as outlined in Figure 3.2 and 3.3 below. For detailed set up instructions refer to K- Line Max 70 system brochure.
- 3) Upon correct set-up of the pods check the failsafe is operational.
- 4) Start the irrigation system at the shed/pond hub and return to the paddock to check the irrigation system is operating correctly.
- 5) Record details of the effluent disposal duration and location and keep records for future reference. Record these details on a form such as the one attached as Appendix D.



## Moving standard pods: step by step

**Before Irrigating**

 <p><b>1. Soil</b></p> <p>Check the soil moisture. Is it too wet to irrigate? Never use pods in the rain.</p>	 <p><b>2. Location suitable for conditions</b></p> <p>Check irrigation record sheet, are pods are in the right location. Make sure pods not near waterways, tiles, gullies.</p>	
 <p><b>3. Pump - OFF</b></p> <p>Turn off pump</p>	 <p><b>4. Hydrant - OFF</b></p> <p>Turn off or disconnect hydrant at paddock.</p>	 <p><b>5. Open Valves</b></p> <p>Open all valves at end of each pod line, allow lines to empty before moving. Disconnect tow fittings (if attached) and take tow fitting to other end of pod line</p>
 <p><b>6. Undo cam</b></p> <p>Disconnect all cam locks connecting pod lines to feed line</p>	 <p><b>7. Close valves</b></p> <p>Close all end valves when empty</p>	 <p><b>8. Cap</b></p> <p>Close valve or put on cap on line at the drag end so dirt and stones do not enter pipes while towing</p>
 <p><b>9. Vehicle direction</b></p> <p>Face the tow vehicle the direction the line is to be towed.</p>	 <p><b>10. Connect tow</b></p> <p>Attach tow hook to tow vehicle</p>	 <p><b>11. Drive smoothly</b></p> <p>Drive smoothly to new location, use wide U shaped turns not V</p>

**Figure 3.2: Step by step guide before irrigation.**



**12. Line up**  
Line up pod line with markers on the fence. If no markers avoid cross over spray approx. 25m

**13. Tow hose**  
Once line is in place unhook and go to next line. Move all lines. Repeat until lines have been moved

**14. Connect cam**  
Connect cam locks and move caps and towing systems to end of each line if at wrong end.

**15. Open valves**  
Open all valves that are connected to the feed line

**16. End of line valves**  
Check all end of line valves and/or caps are closed before turning pump on

**17. Turn on**  
Turn system on

**18. Check valves**  
Check valves all shut again after system is on

**19. Check pods**  
Check each pod is spraying properly. Spray should be fan shape not a solid jet. Look for blocked nozzles and leaks in the line. Have spare nozzles on hand and repair as required.

**Figure 3.3: Step by step guide before irrigation continued.**



### 3.3 Irrigator Failure

1) The irrigation system is protected from continuing to irrigate in the event of a system failure by a failsafe system. The failsafe for the pods works on pressure with the pump automatically switching off in the event the system pressure goes outside a pre-set range.

2) The key errors to check if the system shuts off are:

- Pods Low Pressure:
  - Leak in pipe or camlock
  - Broken sprinkler head
  - Open ended line
- Pods High Pressure:
  - Pipe blockage
  - Sprinkler blocked

3) The pods can be restarted from the central hub by pressing the irrigate button. This should only be done after the source of the failure has been investigated and repaired. Any repairs that cannot be carried out on farm will be referred to a qualified service technician.

### 3.4 System Maintenance

1) Weekly Checks

- Clean out effluent sumps. Place solids on a sealed surface.
- Check pump and float switches are clear and operational.
- Check pond level.
- Clean effluent line camlocks and check effluent lines have no cuts, splits or bulges.
- Check pipes running from the dairy shed to the sludge beds are not restricted.
- Check pond odour levels are not excessive.

Pods

- Check pod body has no cracks and the connections are secure
- Check pod knocker arms are not broken
- Clean effluent pipe connections and make sure they are not loose or leaking.
- Check failsafe operation

2) Monthly Checks

- Check the amount of solids accumulated in the sludge beds. Clean out if required by spreading directly to land (<10mm depth) when conditions are suitable (appropriate soil moisture deficit and soil temperature to facilitate plant growth).
- Clean effluent pipe connections and make sure they are not loose or leaking.
- Check all hydrants

3) Annual Checks

- Service the effluent irrigation pump – strip pump, oil and clean and check the pump seals/impeller.
- Flush clean water through the delivery line to clean out pipes and irrigation lines.
- Check weeping wall slates and repair if required.
- De-sludge pond if required.

Pods

- Check pressure being achieved at the pods is at or above 36PSI.
- Measure the pod application rate and depth



4) Any matters requiring follow up shall be followed up immediately or referred to the farm owner or qualified service technician.

### **3.5 Emergency Irrigation Procedures**

1) In the event that irrigation needs to take place in unsuitable conditions (i.e. heavy rain, water logged soils) due to an immediate issue, such as an emanate risk of a pond overflow or mechanical breakdown, the following measures will be undertaken prior to and after irrigating:

- The farm owner shall be immediately notified;
- Environment Southland shall be contacted on 0800 76 88 45;
- A farm walk shall be conducted to determine the most suitable paddock for irrigation. This shall be a paddock with the least obvious signs of water logging (surface water ponding or wet areas), no tile drains, no waterways nearby and no recent grazing;
- A written record must be maintained of the reasons for the use of the emergency irrigation;
- procedure, what paddock irrigation occurred in and why this paddock was selected; and
- Irrigation should only occur for the length of time required to elevate the immediate issue that led to the use of this procedure.





## 3.6 Troubleshooting

### 3.6.1 Pods

<i>Can I see a problem?</i>		<i>What should I do?</i>
<p><b>Not enough pressure</b></p> <p>Spray too thick and not throwing far enough</p> <p>Expected throw distances:</p> <ul style="list-style-type: none"><li>• Small black pods – 12m</li><li>• Small white and purple -14m</li><li>• Big black pods -20m</li></ul>		<p>STOP irrigating and tell your manager/ farm owner</p> 
<p><b>Blockage in pod</b></p> <p>Effluent dribbling out of pod</p>		<p>STOP irrigating and tell your manager / farm owner.</p> <p>Clear blocked pod, and check solid separator for problems</p> 
<p><b>Broken knocker arm/counter balance.</b></p> <p>Spray coming out as solid jet not fan shape</p>		<p>STOP irrigating and tell your manager / farm owner.</p> <p>Replace broken parts</p> 
<p><b>Top broken</b></p> <p>Spray going in two directions, out nozzle and straight up</p>		<p>STOP irrigating and tell your manager / farm owner.</p> <p>Replace broken parts</p> 
<p><b>Saddle leaking</b></p> <p>Spray will be leaking and puddling around pod</p>		<p>STOP irrigating and tell your manager / farm owner.</p> <p>Tighten, replace or repair</p> 



### 3.6.2 In the Paddock

<i>Can I see a problem?</i>		<i>What should I do?</i>
Effluent running off in to waterways, streams or rivers		STOP irrigating and tell your manager/ farm owner. Move the irrigator away from waterways  
A bad connection between hoses, foaming or puddling leaking from connection		STOP irrigating and reconnect. If parts need replacing tell your manager/ owner  
A leak in the pipe - effluent is pooling in and around the pipe in the paddock		STOP irrigating and fix the leak temporarily if possible, tell your manager/owner  

### 3.6.3 Ponding

<i>Can I see a problem?</i>		<i>What should I do?</i>
Small puddles or ponding after irrigation that don't disappear for a while		Tell your manager/ farm owner  
Large puddles, ponding or sludge remains for many hours and can be seen on pasture		STOP irrigating and tell your manager/ farm owner  



### 3.7 Slurry Tanker / Muck Spreader Application of Effluent

Applications of effluent via a slurry tanker will occur directly from the effluent ponds or the weeping wall sumps. The criteria in Section 3.1 will be used to determine if irrigation should occur along with Section 3.2. Assuming conditions are suitable for irrigation, effluent will be sucked from the effluent storage ponds into the tanker and subsequently spread on suitable paddocks at a depth not exceeding 5 mm for both areas on the Effluent Application Area Map (Appendix C). The slurry tanker will only be operated by the farm owner, senior management or an experienced contractor.

### 3.8 Solid Effluent Applications

Effluent solids from the sumps and weeping wall areas shall be discharged to land in accordance with Rule 38 of the Proposed Southland Water and Land Plan by observing the following application requirements:

- a) Soil moisture levels need to be below field capacity;
- b) Soil temperature must be above 5 degrees in winter/autumn and 7 degrees in spring;
- c) No effluent is to be applied within 20 m of the property boundary, a bore, or a waterway; and
- d) The average depth of application must be 10 mm or less.

A guide to the farms soil moisture and soil temperature can be obtained from the Environment Southland soil moisture site located at Tussock Creek ([www.es.govt.nz](http://www.es.govt.nz)).

### 3.9 Effluent System Upgrade/ Repairs

The following table lists the current upgrades/repairs that are to be undertaken to the effluent irrigation system and future system analysis work planned.

Table 3.1: System Upgrade/Repairs Table Format

Area	Issue	Solution	Timeframe
Example: Travelling Irrigator	Leaking flange seal causing a pressure drop in the system and slow- moving irrigator.	Replace flangeseal and correctly gear irrigator.	2 weeks



### **3.10 Effluent System Training**

The efficient operation of the effluent system requires staff to be informed and aware of any permit conditions and the steps required to be undertaken when operating the system.

Staff shall familiarise themselves with the details of this plan and the owner will be responsible for ensuring that staff are trained in the operation and maintenance of the effluent discharge system and any training of new employees.

A guide to staff training requirements is detailed in Appendix E and shall be completed once training has been provided. Effluent training should be revisited or recapped at the beginning of each season to ensure all staff, new and existing are aware of consent requirements and responsibilities.

All staff dealing with the day-to-day operation of the effluent disposal system will be appropriately trained by senior management.

### **3.11 Farm Map**

The farm map is located in Appendix A. This map outlines the location of surface waterways. Tile drainage is assumed to be present in all paddocks except on Tuffin Hill and Shark's Tooth Hill. During wet or very dry conditions (soil cracking) effluent will not be applied in areas where significant cracks or swales (wet conditions only) are located to avoid any risk of surface water contamination. In normal conditions effluent can safely applied over tile drains and swales as effluent application depths are low enough to ensure effluent is retained in the plant root zone of the soil. Where the operator suspects there may be a risk of effluent entering a tile drain a visual inspection will be made of the tile exit point and immediate action taken to block the tile if any effluent discharge is occurring.

Environment Southland shall be notified of any such instances.

### **3.12 Effluent Application Rates**

Every 24 months the application rate of the of the pods will be tested to ensure it complies with the application depth of 10 mm/hr. Any irrigator testing will be carried out by a suitably qualified person in accordance with Dairy NZ best practice specifications for measuring the application depths and rates for the various systems used on the property.

Results of the irrigation tests will be retained and made available to Environment Southland on request.

### **3.13 Discharge Permit**

The Discharge Permit for the farm (once granted) will be contained in Appendix F.

### **3.14 Key Contacts**

Environment Southland – 0800 76 88 45



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## **4 APPENDECIES**

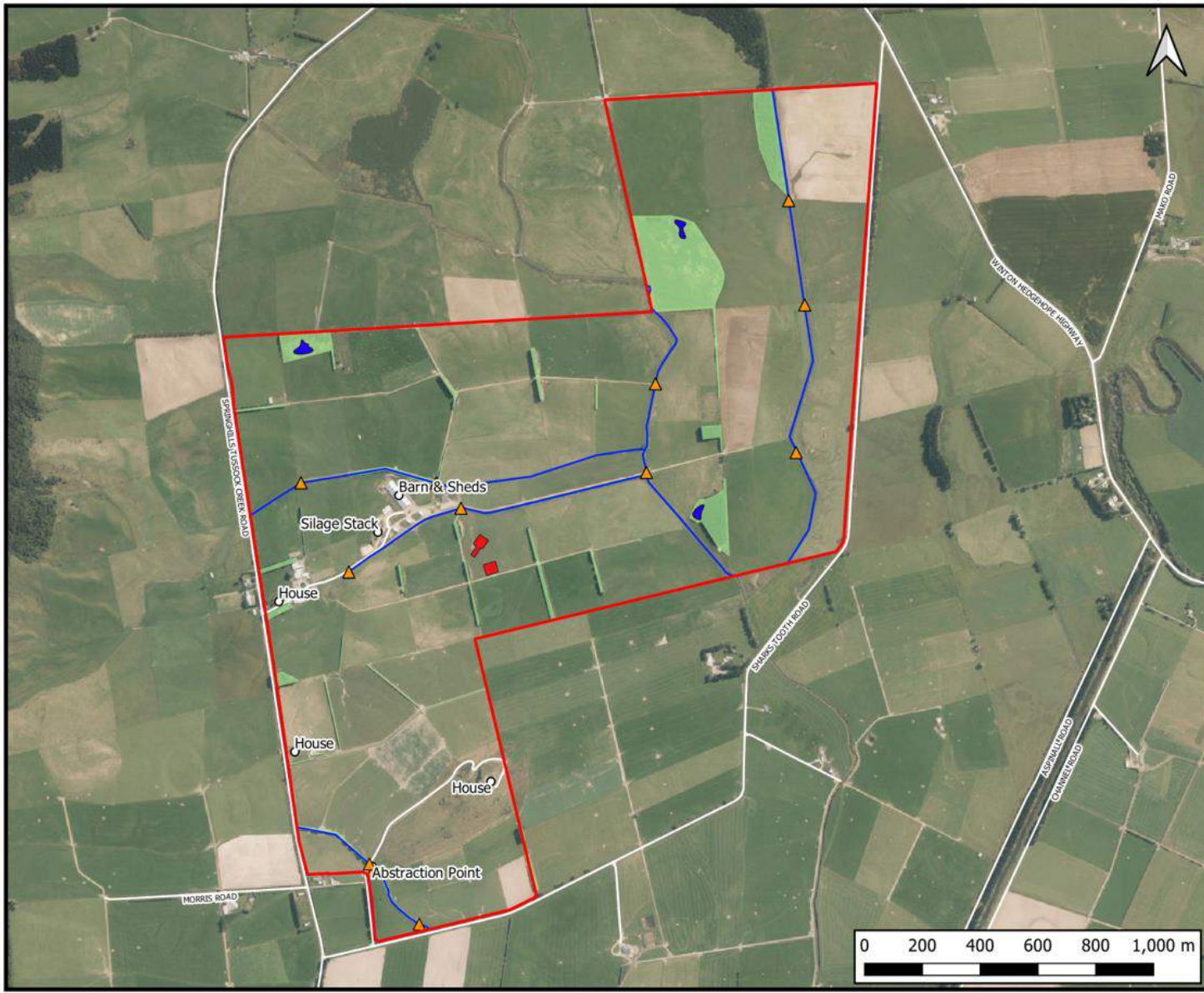
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- Appendix A – Farm Map
- Appendix B – Soil Factsheets
- Appendix C – Effluent Application Area
- Appendix D – Effluent Location Recording Sheet
- Appendix E – Staff Training Checklist
- Appendix F – Discharge Permit



# **APPENDIX A**

## **Farm Map**



**LEGEND**

- 444 Springhills-Tussock Creek Road
- ▲ Stock Crossings
- Fenced Waterways
- Effluent Ponds
- Ponds
- Shelter Belts, Trees and/or Riparian Planting

**CLIENT**

Capil Grove Limited

**TITLE**

Site Feature Map



**STATUS**

<b>SCALE</b>	<b>DATE/TIME</b>
NOT TO SCALE	2021-12-15 16:10
<b>JOB NUMBER</b>	<b>FIGURE NUMBER</b>
10740	N/A
	<b>MAP ID</b>
	213





# **APPENDIX B**

## **Soil Factsheets**



## Makarewa\_3b.1

Report generated: 11-Feb-2021 from <https://smap.landcareresearch.co.nz>

Makar\_3b.1 (100% of the mapunit at location (1250546, 4872504), Confidence: Low)

This information sheet describes the typical average properties of the specified soil to a depth of 1 metre, and should not be the primary source of data when making land use decisions on individual farms and paddocks. S-map correlates soils across New Zealand. Both the old soil name and the new correlated (soil family) name are listed below.

Capture of the base soil information in this region was funded by Environment Southland and MWLR.

### Soil Classification

<p><b>Soil Classification:</b> Typic Orthic Gley Soils (GOT)</p> <p><b>Family Name:</b> Makarewa (Makar)</p> <p><b>Sibling Name:</b> Makarewa_3b.1 (Makar_3b.1)</p>	<p><b>Soil profile material</b> Stoneless soil</p> <p><b>Profile texture</b> clay</p> <p><b>Parent Material</b> Stones/rocks not applicable</p>	<p><b>Depth class (diggability)</b> Deep (&gt; 1 m)</p> <p><b>Soil material</b> tuffaceous sandstone rock</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------

**Origin**  
Alluvium

### Soil Sibling Concept

This soil belongs to the Gley soil order of the New Zealand soil classification. Gley soils are strongly affected by waterlogging, have been chemically reduced, have light grey subsoils, and usually have reddish brown or brown mottles. Waterlogging occurs in winter and spring, and some soils remain wet all year. It is formed in alluvial sand silt or gravel deposited by running water, from hard tuffaceous sandstone parent material.

The topsoil typically has clay texture and is stoneless. The subsoil has dominantly clay textures, with gravel content of less than 3%. The plant rooting depth extends beyond 1m.

Generally the soil is poorly drained with very high vulnerability of water logging in non-irrigated conditions, and has high soil water holding capacity. Inherently these soils have a moderate structural vulnerability and a very low N leaching potential, which should be accounted for when making land management decisions.



### About this publication

- This information sheet describes the *typical average properties* of the specified soil.
- For further information on individual soils, contact Landcare Research New Zealand Ltd: [www.landcareresearch.co.nz](http://www.landcareresearch.co.nz)
- Advice should be sought from soil and land use experts before making decisions on individual farms and paddocks.
- The information has been derived from numerous sources. It may not be complete, correct or up to date.
- This information sheet is licensed by Landcare Research on an "as is" and "as available" basis and without any warranty of any kind, either express or implied.
- Landcare Research shall not be liable on any legal basis (including without limitation negligence) and expressly excludes all liability for loss or damage howsoever and whenever caused to a user of this factsheet.

## Makarewa\_3b.1

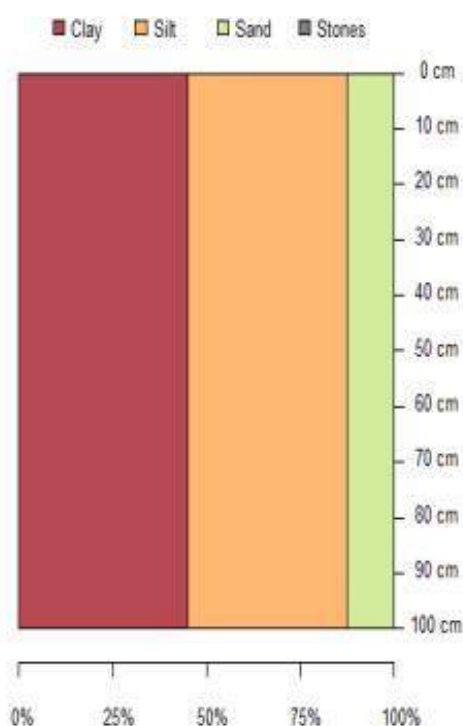
### Soil horizons

Characteristics of functional horizons in order from top to base of profile:

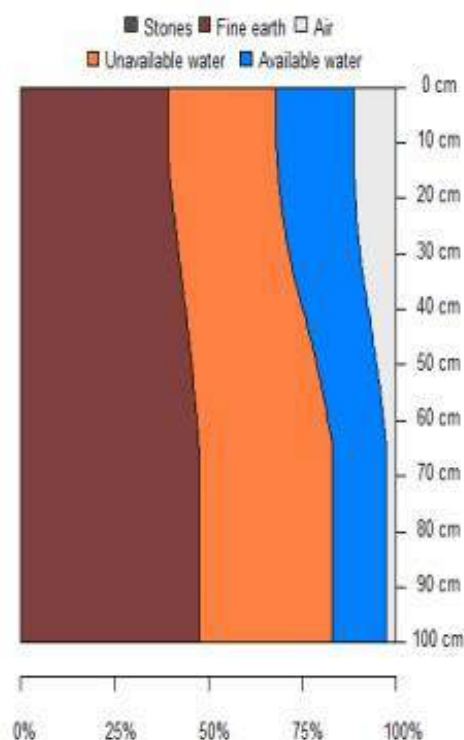
Functional Horizon	Thickness	Stones	Clay*	Sand*	Permeability
Clayey Weak	15 - 25 cm	0 %	30 - 60 %	5 - 20 %	rapid
Clayey Weak	10 - 25 cm	0 %	30 - 60 %	5 - 20 %	rapid
Clayey Coarse	50 - 75 cm	0 %	30 - 60 %	5 - 20 %	slow

\* clay and sand percent values are for the mineral fines (excludes stones). Silt = 100 - (clay + sand)

### Texture



### Water Retention



The values for the graphs above have been generated from horizon and pedotransfer data. These values have then been splined to create continuous estimates of soil water holding capacity and particle size distribution the soil profile. These curves express the particle size distribution and water retention of the soil however there may be barriers to rooting depth that are not necessarily represented in these properties directly. It is advisable to check the potential rooting depth and rooting barrier fields in the soil physical properties section on page three of this factsheet.

## Makarewa\_3b.1

### Soil physical properties

**Depth class (diggability)**

Deep (> 1 m)

**Potential rooting depth**

Unlimited

**Rooting barrier**

No significant barrier within 1 m

**Depth to hard rock**

No hard rock within 1 m

**Depth to soft rock**

No soft rock within 1 m

**Depth to stony layer class**

No significant stony layer within

**Texture profile**

Clay

**Topsoil stoniness**

Stoneless

**Topsoil clay range**

30 - 60 %

**Drainage class**

Poorly drained

**Permeability profile**

Moderate over slow

**Depth to slowly permeable horizon**

20 - 50 (cm)

**Permeability of slowest horizon**

Slow (< 4 mm/h)

**Aeration in root zone**

Very limited

**Profile available water**

(0 - 30cm or root barrier)

High (60 mm)

(0 - 60cm or root barrier)

High (107 mm)

(0 - 100cm or root barrier)

High (164 mm)

**Dry bulk density****topsoil**

0.87 g/cm<sup>3</sup>

**subsoil**

0.87 g/cm<sup>3</sup>

### Soil chemical properties

**Topsoil P retention**

Medium (38%)

### Soil management factors

Vulnerability classes relate to soil properties only and do not take into account climate or management.

**Soil structure integrity****Structural vulnerability**

Moderate (0.54)

**Pugging vulnerability**

not available yet

**Septic tank installation category**

A1 if slope > 15 deg otherwise B2

**Contaminant management****N leaching vulnerability**

Very low

**P leaching vulnerability**

not available yet

**Dairy effluent (FDE) risk category**

B

**Water management****Water logging vulnerability**

High

**Drought vulnerability - if not irrigated**

Low

**Bypass flow**

High

**Hydrological soil group**

D

**Relative Runoff Potential**

### SINDI - Soil quality Indicators

**SINDI - Soil Quality Indicators**

A suite of soil quality indicators is available from <http://sindi.landcareresearch.co.nz/>

- Compare your soil with information from our soils databases.
- Assess the intrinsic resources and biological, chemical and physical quality of your soil
- See how your soil measures up against current understanding of optimal values.
- Learn about the effect each indicator has on soil quality and some general management practices that could be implemented to improve soil quality.

## Pukemutu\_6a.1

Report generated: 11-Feb-2021 from <https://smap.landcareresearch.co.nz>

Pukem\_6a.1 (100% of the mapunit at location (1249838, 4872293), Confidence: Low)

This information sheet describes the typical average properties of the specified soil to a depth of 1 metre, and should not be the primary source of data when making land use decisions on individual farms and paddocks. S-map correlates soils across New Zealand. Both the old soil name and the new correlated (soil family) name are listed below.

Capture of the base soil information in this region was funded by Environment Southland and MWLR.

### Soil Classification

#### Soil Classification:

Argillic-fragic Perch-gley Pallic Soils (PPJX)

#### Family Name:

Pukemutu (Pukem)

#### Sibling Name:

Pukemutu\_6a.1 (Pukem\_6a.1)

#### Soil profile material

Stoneless soil

#### Profile texture

silt over clay

#### Parent Material

Stones/rocks  
not applicable

#### Depth class (diggability)

Moderately deep (40 - 80 cm)

#### Soil material

tuffaceous sandstone rock

#### Origin

Loess

### Soil Sibling Concept

This soil belongs to the Pallic soil order of the New Zealand soil classification. Pallic Soils have pale coloured subsoils, due to low contents of iron oxides, have weak soil structure and high density in subsurface horizons. Pallic Soils tend to be dry in summer and wet in winter. It is formed in a blanket deposit of silt sized windblown materials, from hard tuffaceous sandstone parent material.

The topsoil typically has silt texture and is stoneless. The subsoil has dominantly clay textures, with gravel content of less than 3%. The plant rooting depth is 40 - 80 (cm), due to a continuous hard pan that impedes root growth and oxygen supply.

Generally the soil is poorly drained with very high vulnerability of water logging in non-irrigated conditions, and has moderate soil water holding capacity. Inherently these soils have a high structural vulnerability and a moderate N leaching potential, which should be accounted for when making land management decisions.



Perch-gley  
Pallic

### About this publication

- This information sheet describes the *typical average properties* of the specified soil.
- For further information on individual soils, contact Landcare Research New Zealand Ltd: [www.landcareresearch.co.nz](http://www.landcareresearch.co.nz)
- Advice should be sought from soil and land use experts before making decisions on individual farms and paddocks.
- The information has been derived from numerous sources. It may not be complete, correct or up to date.
- This information sheet is licensed by Landcare Research on an "as is" and "as available" basis and without any warranty of any kind, either express or implied.
- Landcare Research shall not be liable on any legal basis (including without limitation negligence) and expressly excludes all liability for loss or damage howsoever and whenever caused to a user of this factsheet.

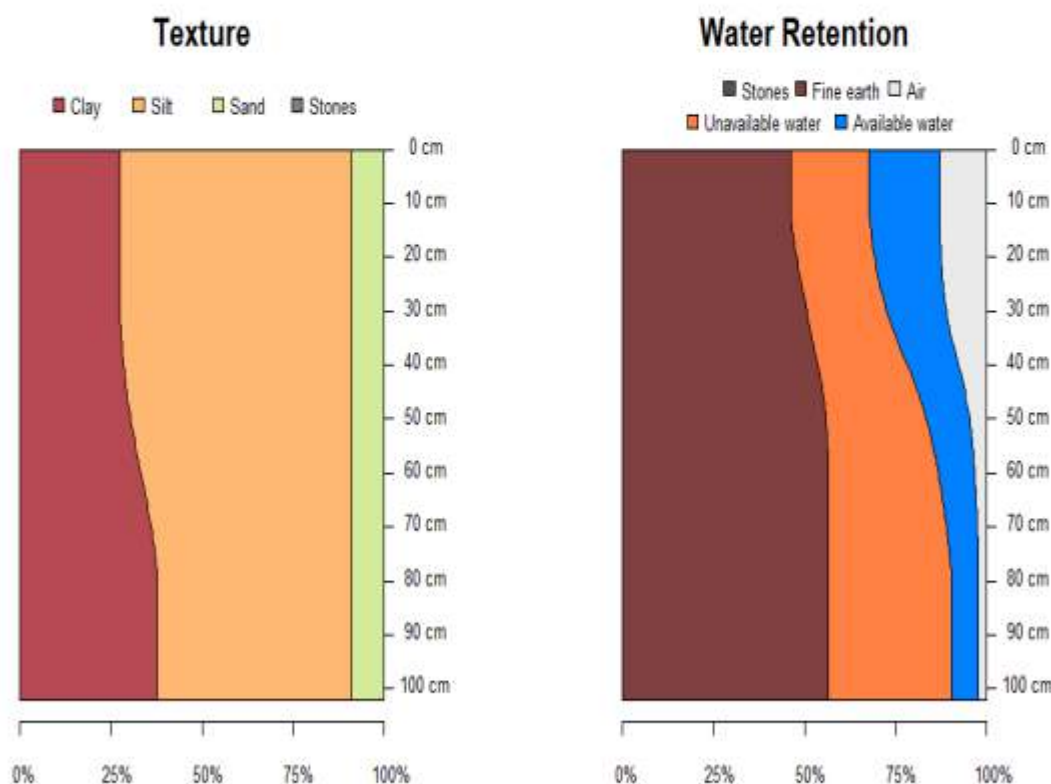
## Pukemutu\_6a.1

### Soil horizons

Characteristics of functional horizons in order from top to base of profile:

Functional Horizon	Thickness	Stones	Clay*	Sand*	Permeability
Loamy Weak	20 - 25 cm	0 %	20 - 35 %	3 - 15 %	rapid
Loamy Weak	10 - 20 cm	0 %	20 - 35 %	3 - 15 %	rapid
Loamy Coarse Slightly Firm	10 - 30 cm	0 %	25 - 35 %	3 - 15 %	moderately slow
Clayey Coarse	30 - 60 cm	0 %	35 - 40 %	3 - 15 %	slow

\* clay and sand percent values are for the mineral fines (excludes stones). Silt = 100 - (clay + sand)



The values for the graphs above have been generated from horizon and pedotransfer data. These values have then been splined to create continuous estimates of soil water holding capacity and particle size distribution the soil profile. These curves express the particle size distribution and water retention of the soil however there may be barriers to rooting depth that are not necessarily represented in these properties directly. It is advisable to check the potential rooting depth and rooting barrier fields in the soil physical properties section on page three of this factsheet.

## Pukemutu\_6a.1

### Soil physical properties

<b>Depth class (diggability)</b> Moderately deep (40 - 80 cm)	<b>Texture profile</b> Silt over clay	<b>Drainage class</b> Poorly drained
<b>Potential rooting depth</b> 40 - 80 (cm)	<b>Topsoil stoniness</b> Stoneless	<b>Permeability profile</b> Moderate over slow
<b>Rooting barrier</b> Pan	<b>Topsoil clay range</b> 20 - 35 %	<b>Depth to slowly permeable horizon</b> 40 - 80 (cm)
<b>Depth to hard rock</b> No hard rock within 1 m		<b>Permeability of slowest horizon</b> Slow (< 4 mm/h)
<b>Depth to soft rock</b> No soft rock within 1 m		<b>Aeration in root zone</b> Very limited
<b>Depth to stony layer class</b> No significant stony layer within		

### Profile available water

(0 - 30cm or root barrier)	(0 - 60cm or root barrier)	(0 - 100cm or root barrier)
High (56 mm)	High (93 mm)	Moderate (93 mm)

### Dry bulk density

<b>topsoil</b>	<b>subsoil</b>
1.22 g/cm <sup>3</sup>	1.22 g/cm <sup>3</sup>

### Soil chemical properties

#### Topsoil P retention

Low (22%)

### Soil management factors

Vulnerability classes relate to soil properties only and do not take into account climate or management.

<b>Soil structure integrity</b>	<b>Contaminant management</b>	<b>Water management</b>
<b>Structural vulnerability</b> High (0.69)	<b>N leaching vulnerability</b> Medium	<b>Water logging vulnerability</b> High
<b>Pugging vulnerability</b> not available yet	<b>P leaching vulnerability</b> not available yet	<b>Drought vulnerability - if not irrigated</b> Moderate
<b>Septic tank installation category</b> A1 if slope > 15 deg otherwise A2	<b>Dairy effluent (FDE) risk category</b> B	<b>Bypass flow</b> Medium
		<b>Hydrological soil group</b> D
		<b>Relative Runoff Potential</b>

### SINDI - Soil quality Indicators

#### SINDI - Soil Quality Indicators

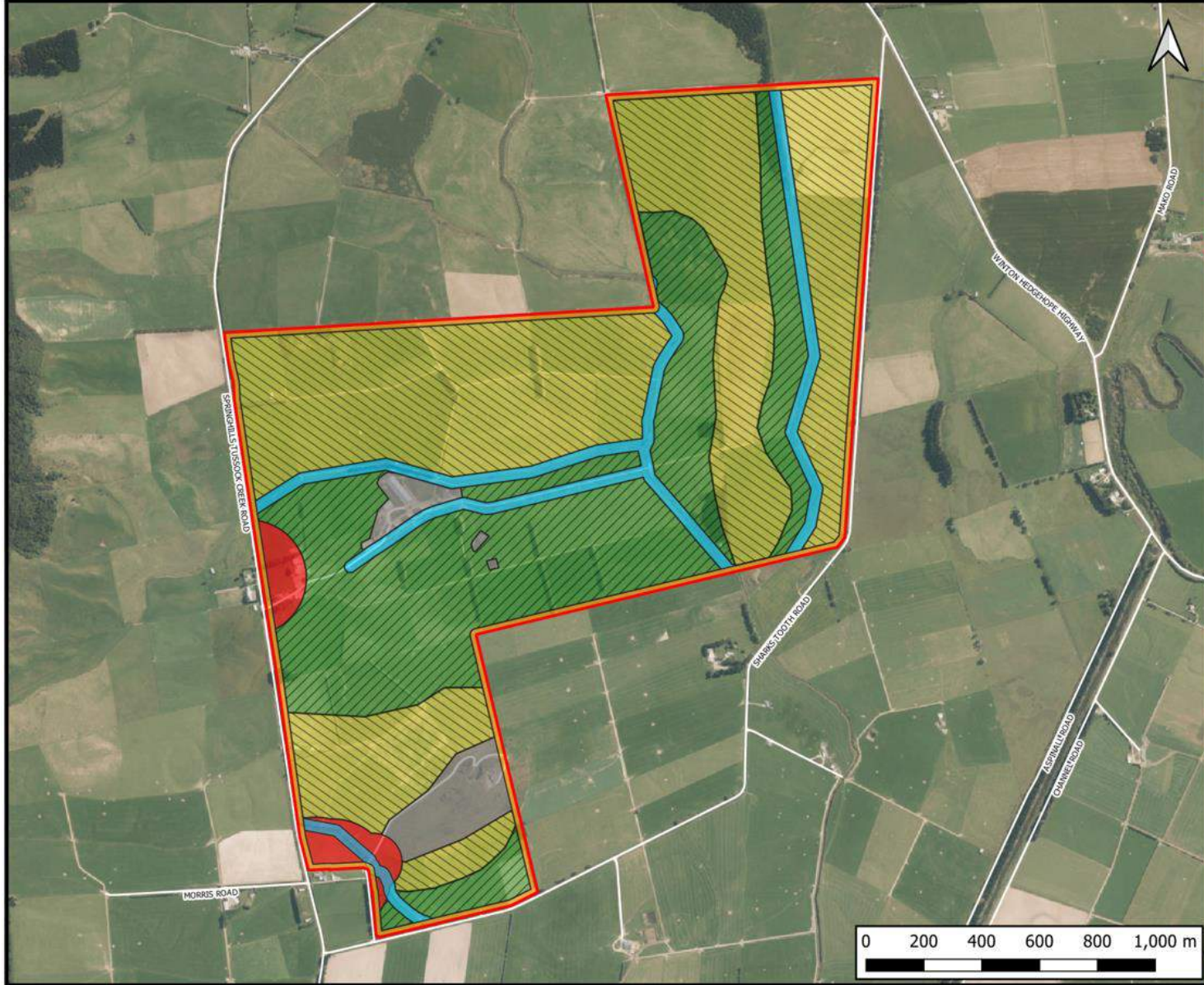
A suite of soil quality indicators is available from <http://sindi.landcareresearch.co.nz/>

- Compare your soil with information from our soils databases.
- Assess the intrinsic resources and biological, chemical and physical quality of your soil
- See how your soil measures up against current understanding of optimal values.
- Learn about the effect each indicator has on soil quality and some general management practices that could be implemented to improve soil quality.



# **APPENDIX C**

## **Effluent Application Area**



**LEGEND**

- 444 Springhills-Tussock Creek Road
- 20 m Property Boundary Buffer
- 20 m Waterways Buffer
- Dwelling & Abstraction Buffers

**Effluent Application Areas**

- Area 1
- Area 2
- Not Blocked (No Effluent)

**CLIENT**

Capil Grove Limited

**TITLE**

**Farm 444 Property Boundary -  
444 Springhills-Tussock Creek  
Road**



<b>STATUS</b>	
<b>SCALE</b> NOT TO SCALE	<b>DATE/TIME</b> 2021-12-15 16:17
<b>JOB NUMBER</b> 10740	<b>FIGURE NUMBER</b> N/A
	<b>MAP ID</b> 210





# **APPENDIX D**

## **Effluent Location Recording Sheet**

Collected animal effluent management					
Effluent application diary				Month	
Date	Paddock	Run number	Operating problems noted	Actions taken	Signature
1					
2					
3					
4					
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10					
11					
12					
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30					
31					



# **APPENDIX E**

## **Staff Training Checklist**

# Effluent Orientation and Training Record

Season \_\_\_/\_\_\_

Effluent Competencies	Employee name	Employee name	Employee name
<b>General</b>			
Understands the regional council rules and farm policies for effluent management			
Understands health and safety around the effluent system			
Understands record keeping for irrigator runs and maintenance			
<b>At the Dairy</b>			
Use of stormwater diversion system			
Good hosing practice and water management			
Animal handling to minimise effluent volume			
Cleaning the stone trap			
Sump, pump & pond monitoring and management (including float switches)			
<b>In the Paddock</b>			
When to irrigate: assessing soil and weather conditions			
Where to irrigate: runs, paddock rotations, high risk vs low risk soils etc (mark on farm map)			
Where not to irrigate: near waterways, drains, boundaries, slopes etc (mark on farm map)			
How the irrigator works, how to use it, set up, hose layout and performance			



# **APPENDIX F**

## **Discharge Permit**



## **Appendix D Producer Statement and Proposed Pond Design**

**FORM OF PRODUCER STATEMENT FOR:  
DESIGN OF COLLECTED AGRICULTURAL EFFLUENT STORAGE POND**

**ISSUED BY:** Civil Tech Ltd  
**TO:** Capil Grove Ltd  
**TO BE SUPPLIED TO:** Environment Southland  
**IN RESPECT OF:** Collected Agricultural Effluent Storage Facility  
**AT:** 444 Springhills Tussock Creek Road 181

**CIVIL TECH LTD** has been engaged by Capil Grove Ltd

To provide the following design services: Design for a storage pond

I, Murray Gardyne, (Suitably Qualified Person), a duly authorised representative of  
Civil Tech Ltd

NZCE (civil), REA, Chartered Member Engineering New Zealand (Engineering Technician)

Engineering New Zealand Member No. 209724

believe on reasonable grounds that the storage pond when constructed in accordance with the drawings, specifications, and other documents provided or listed, will comply with the relevant codes and rules stated below.

IPENZ Practice Note 21: Farm Dairy Effluent Pond Design and Construction.



21 December 2021

P O Box 1558

INVERCARGILL 9840

## Application to Construct Effluent Storage (PART B)



This application is made under Section 88 of the Resource Management Act 1991

**A complete Part A form needs to be provided with this Part B form.** The purpose of this Part B form is to provide applicants with guidance on information that is required under the Resource Management Act 1991. These forms are to act as a guide only and Environment Southland reserves the right to request additional information. **This form must be used when applying for consent to construct effluent storage, including waste-water, sludge or effluent from an industrial or trade processes or agricultural effluent (including treatment facilities, such as weeping walls and sludge beds).**

To: Environment Southland  
Private Bag 90116  
Invercargill 9840

### 1 Location of the storage:

Address: 444 Springhills Tussock Creek Road

Legal Description(s): Pt Lot 2 DP 2005.

Map Reference (NZTM 2000): 1250255 E, 4872251 N

### 2 Proposed method of lining the pond storage.

Compacted clay       Synthetic liner       Concrete  
 Other: \_\_\_\_\_

A 1.5mm HDPE liner to GMI – GM13 on Bidim A29 geotextile or similar.

### 6 Construction Details:

Name of designer: Civil Tech Ltd

Name of builder: Arlake Ltd

Name of construction supervisor: Murray Gardyne

Proposed timing of construction: Summer 2021

5. For agricultural effluent storage and sludge design, is the storage to be constructed in accordance with IPENZ Practice Note 21: Farm Dairy Effluent Pond Design and Construction (2013)? If not, please advise what departure from the standards is proposed and why.

Yes



**6 Please provide details of the proximity of the storage to:**

Nearest surface watercourse:	<u>315</u>	metres
Nearest artificial watercourse:	<u>90</u>	metres
Registered drinking water supplies:	<u>NA</u>	metres
Nearest underground drain:	<u>50</u>	metres
Property boundary:	<u>250</u>	metres
Dwellings on neighbouring properties:	<u>515</u>	metres
Coastal marine area:	<u>28,500</u>	metres
Historic heritage	<u>None within 7km</u>	metres
Urban areas	<u>(Winton) 11,000</u>	metres

**7 What is the total volume of the storage pond**

17,800 cubic metres

**8 Please provide a description of all of the sources of waste-water, sludge or effluent to be treated and/or stored in the storage, including the storage capacity of the effluent storage in relation to the volume and nature of the liquid that will enter. For agricultural effluent, you must also attach a Massey Pond Calculator assessment of storage requirements.**

All effluent from the wintering shed will be scrapped and pumped to the storage pond. The extra volume is to irrigate when the nutrients are needed.

**9 Please provide a description the quality of the waste-water, sludge or effluent. Please include all operational procedures, emergency response and proposed monitoring devices to match the scale and quality of the waste-water, sludge or effluent being stored and sensitivity of surrounding environment.**

See Collected Agricultural Effluent Management Plan.

**Please include engineering drawings for the proposed structure(s). This will include, but not be limited to the height of the embankments and placement and orientation of the effluent storage relative to flood flows and stormwater run-off.**

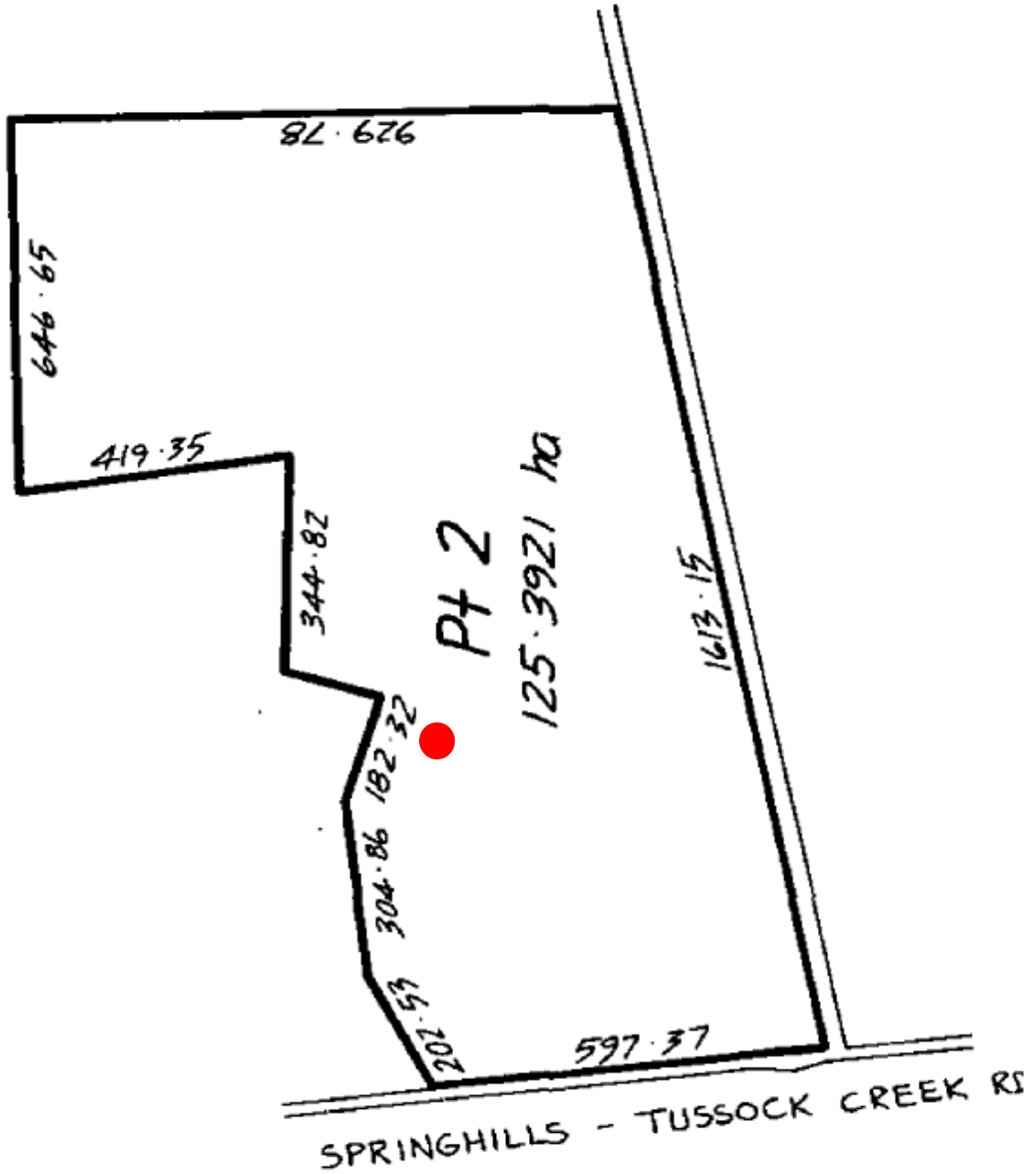
**Please also include a map or aerial photograph showing the following:**

- 1 the location of the proposed storage;
- 2 the total property area boundary;
- 3 surface water bodies, artificial watercourses, installed subsurface drains and wetlands nearby;
- 4 water supplies - bores, registered drinking etc.;
- 5 the coastal marine area and the distance to it (if relevant);
- 6 the location of any dairy sheds and residential dwellings; and  
any additional points of interest – historic heritage, places of assembly etc.

**Please note that upon completion of the storage and prior to discharge, you will be required to provide certification of the design and build by a Chartered Professional Engineer.**

Identifier

SL10B/69



**Design and Construction Checklist**

## Capil Grove Ltd

### Storage pond Volume (new)

Volume	17,800m <sup>3</sup>
Number of days storage	As per DESC
Freeboard	500mm
Minimum batter slope	2:1

### Sludge Bed Size

Complies with Rule 32B	yes
Set out from existing fences	
Access for construction and maintenance equipment provided	
Freeboard	500mm

### Geotechnical Assessment

The material on which the storage pond will be built is gleyed yellow clayey silt and mudstone. The test pit showed that below the topsoil was a high percentage clay silt and then at 1.7m there was mudstone to the bottom of the excavation. The mudstone is hard competent easily broken rock. The site is on a shallow ridge. The topsoil will be removed and the site levelled. The new storage pond will be built into the ridge to provide more storage for less rainfall. The base of the storage pond will be above the water table.

### Hydrological Assessment

At the top of both the silt and mudstone layer some water trapped on top of each layer. It was minimal and there was no ground water in the base. Most of the pond is down into the ridge.

### Design

Complies with Rule 49	Yes
Sealing	1.5mm HDPE synthetic liner GRI – GM13
Bank protection	1.5mm HDPE synthetic liner GRI – GM13
Batter slope	2:1
Effluent will be pumped from the wintering shed	
Protection of pond at entry from shed	A double layer of 1.5mm HDPE

### Construction

Contractor	Arlake Ltd
	20 tonne excavator
	10 tonne roller

Construction sequence	Strip all topsoil from the site as required Level the site base and construct the keyways Borrow to fill the walls Install subsoils and inspection chamber Line the pond Install pipework Place topsoil around the outside walls of the pond, shape and sow
-----------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### Monitoring

Check storage pond level as required.

**Client:** Capil Grove Ltd  
**Location:** Tussock Creek  
**Test by:** Murray Gardyne  
**Date:** 10 September 2021

<b>Location</b>	<b>Depths</b>	<b>Material description</b>
TP 1	0 – 500	Topsoil
	500 – 1700	Gleyed yellow clayey silt
	1700 – 5800	Grey mudstone





**FORM OF PRODUCER STATEMENT FOR:  
DESIGN OF COLLECTED AGRICULTURAL EFFLUENT STORAGE POND**

**ISSUED BY:** Civil Tech Ltd  
**TO:** Capil Grove Ltd  
**TO BE SUPPLIED TO:** Environment Southland  
**IN RESPECT OF:** Collected Agricultural Effluent Storage Facility  
**AT:** 444 Springhill Tussock Creek Road, Tussock Creek

**CIVIL TECH LTD** has been engaged by Capil Grove Ltd

To provide the following design services: Design for an effluent storage pond

I, Murray Gardyne, (Suitably Qualified Person), a duly authorised representative of  
Civil Tech Ltd

NZCE (civil), REA, Chartered Member Engineering New Zealand (Engineering Technician)

Engineering New Zealand Member No. 209724

believe on reasonable grounds that the storage pond when constructed in accordance with the drawings, specifications, and other documents provided or listed, will comply with the relevant codes and rules stated below.

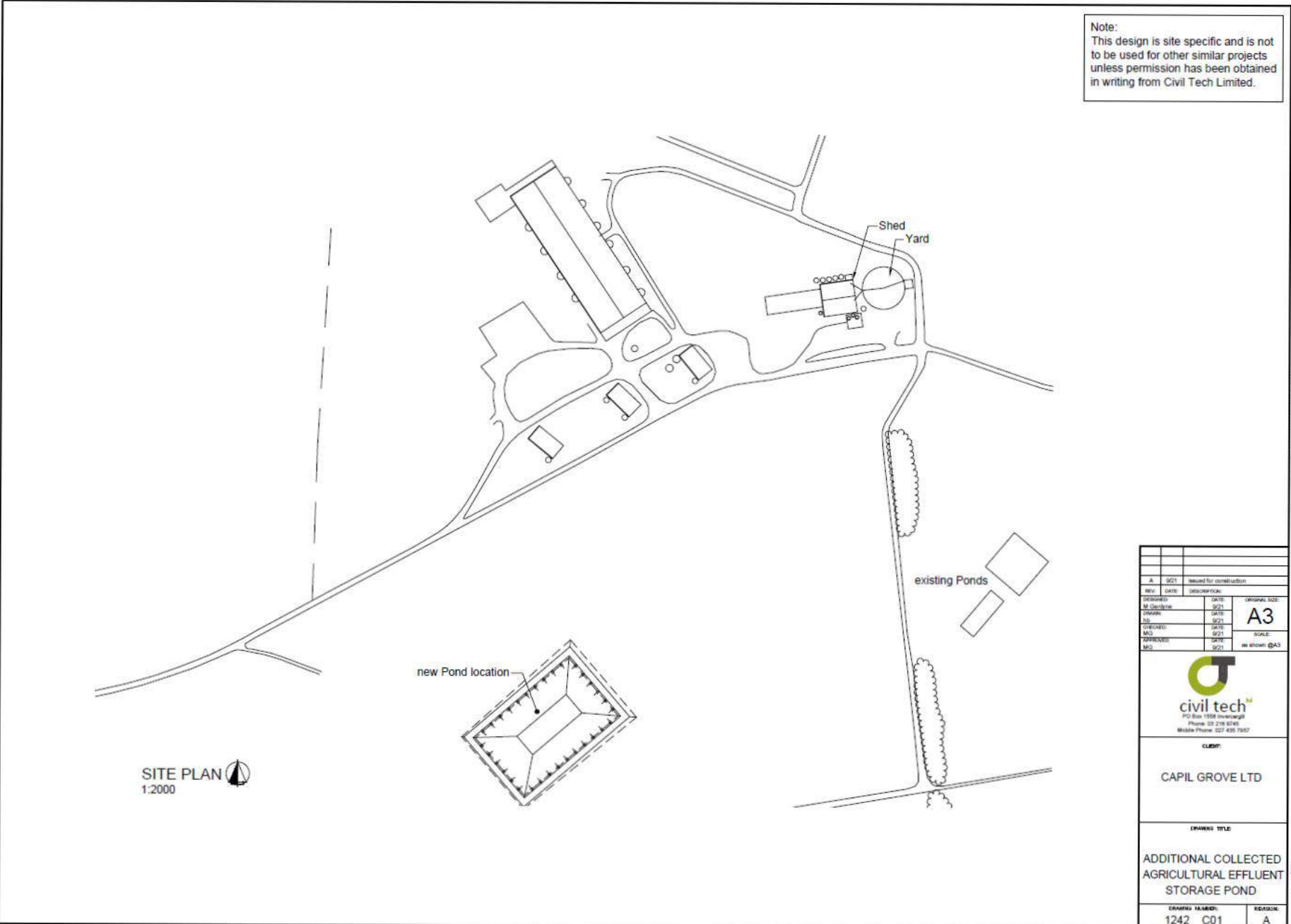
IPENZ Practice Note 21: Farm Dairy Effluent Pond Design and Construction.



16 September 2021

P O Box 1558

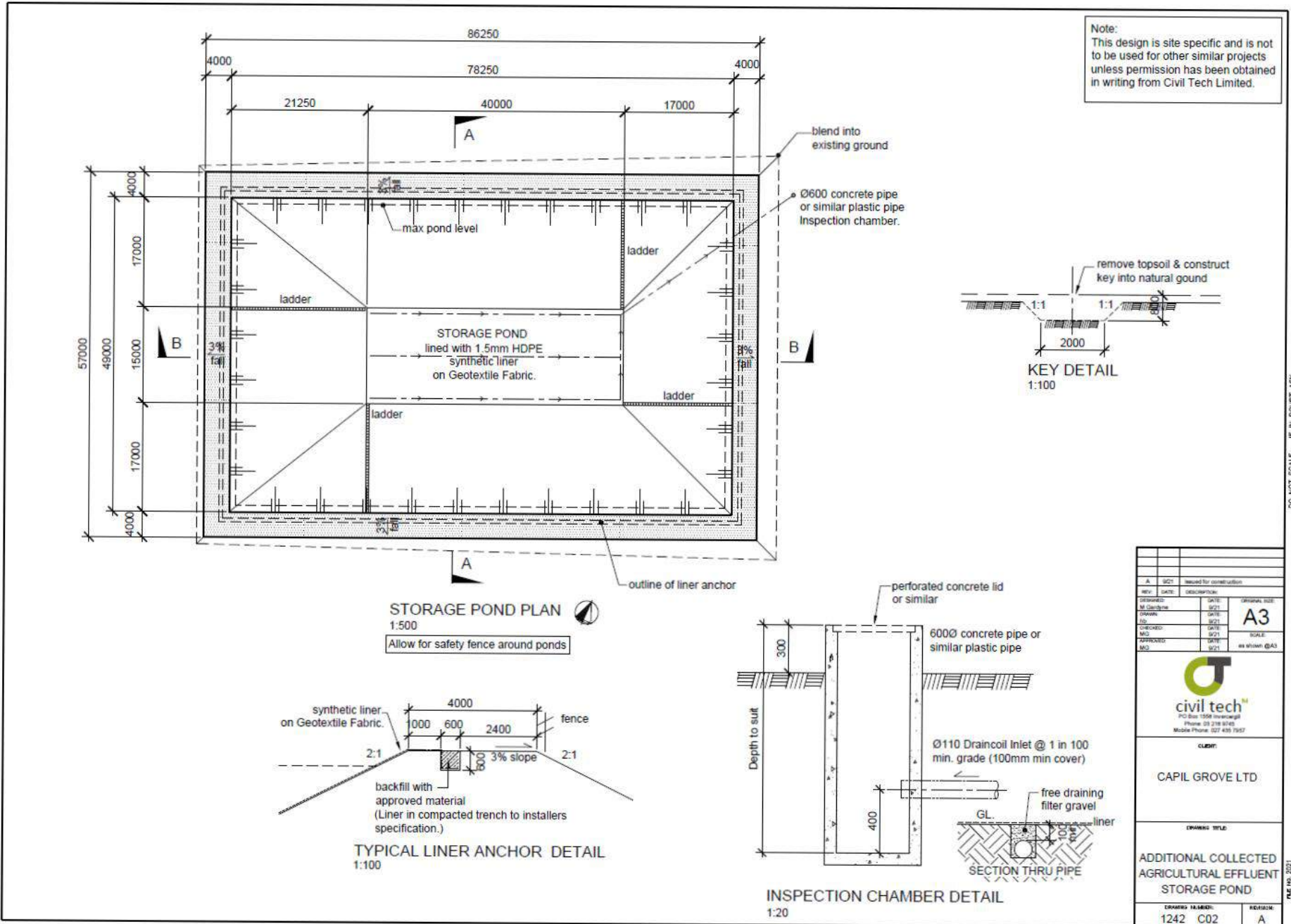
INVERCARGILL 9840



Note:  
This design is site specific and is not to be used for other similar projects unless permission has been obtained in writing from Civil Tech Limited.

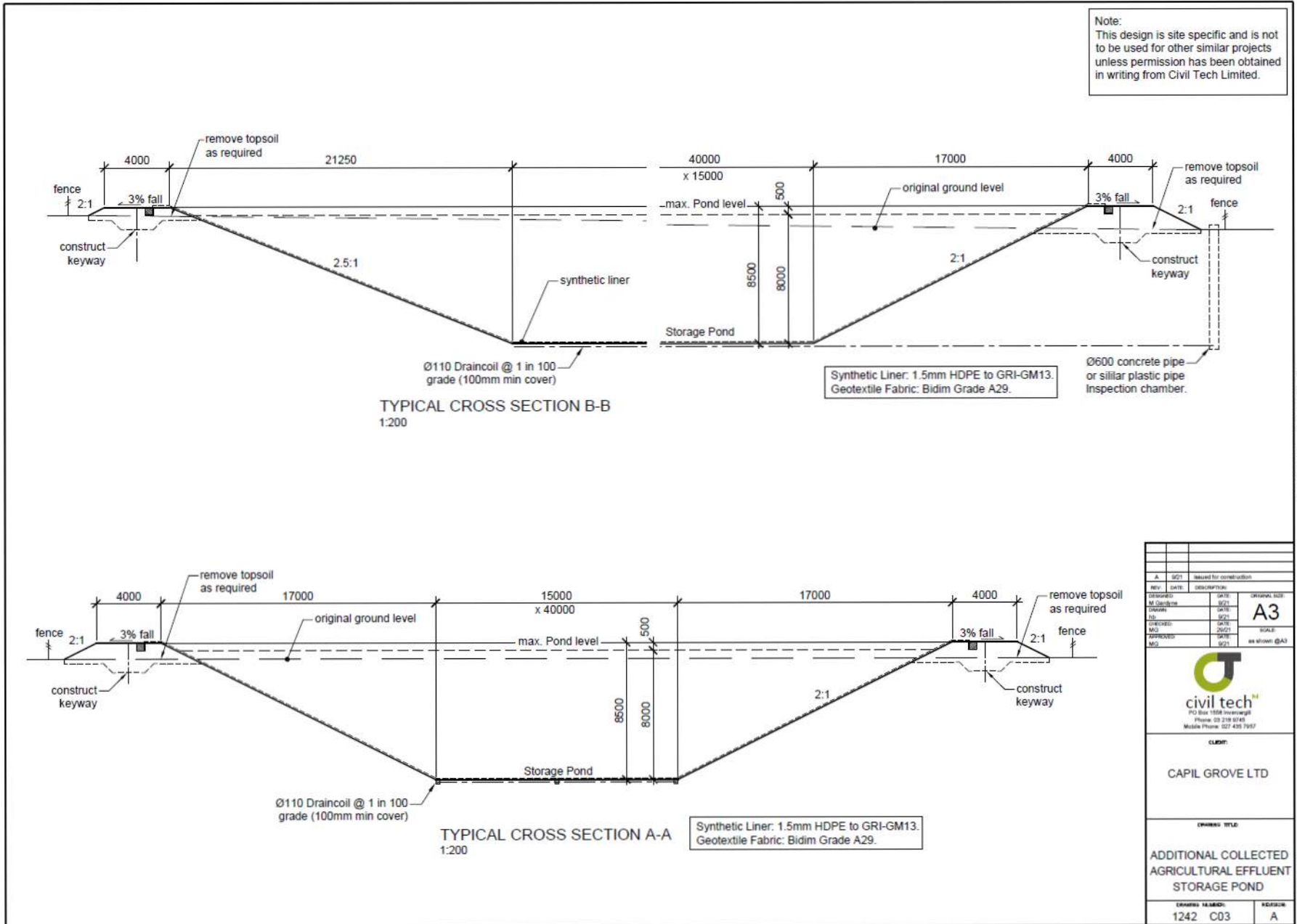
REV	DATE	DESCRIPTION	ORIGINAL SIZE
A	02/21	Issued for construction	
DESIGNED	DATE		<b>A3</b>
DRAWN	DATE		
CHECKED	DATE		
NO	DATE		
APPROVED	DATE	as shown @A3	
 <b>civil tech</b> <sup>TM</sup> PO Box 1858 Invercargill Phone 03 218 8146 Mobile Phone 027 435 7957			
CLIENT:			
CAPIL GROVE LTD			
DRAWING TITLE:			
ADDITIONAL COLLECTED AGRICULTURAL EFFLUENT STORAGE POND			
DRAWING NUMBER:		REVISION:	
1242 C01		A	

DO NOT SCALE - IF IN DOUBT ASK FILE NO. 2021



REV	DATE	DESCRIPTION	SCALE
A	02/1	Issued for construction	
DESIGNED	M. Gardiner	DATE	ORIGINAL SIZE
DRAWN		DATE	A3
CHECKED		DATE	SCALE
APPROVED		DATE	AS SHOWN (A3)
BY		DATE	
 <b>civil tech</b> <sup>TM</sup> PO Box 1558 Invercargill Phone: 03 218 8140 Mobile Phone: 027 435 7957			
CLIENT			
CAPIL GROVE LTD			
DRAWING TITLE			
ADDITIONAL COLLECTED AGRICULTURAL EFFLUENT STORAGE POND			
DRAWING NUMBER:		REVISION	
1242 C02		A	





Note:  
This design is site specific and is not to be used for other similar projects unless permission has been obtained in writing from Civil Tech Limited.

A		ISSUED FOR CONSTRUCTION		<b>A3</b> SCALE: as shown (A3)
REV	DATE	DESCRIPTION	DRAWN BY	
DESIGNED BY	DATE			
CHECKED BY	DATE			
APPROVED BY	DATE			
 <b>civil tech</b> <sup>TM</sup> 112 Bala 1000 Invermay Phone: 09 218 9748 Mobile Phone: 027 439 7957				
CLIENT:				
CAPIL GROVE LTD				
DRAWING TITLE:				
ADDITIONAL COLLECTED AGRICULTURAL EFFLUENT STORAGE POND				
DRAWING NUMBER:		REVISION:		
1242 C03		A		

DO NOT SCALE - IF IN DOUBT ASK

PLG No. 2021

**Specification for Earthworks Construction  
for Effluent Storage Pond**

**Client: Capil Grove Ltd**

**Location: Tussock Creek**

**Project No.: 1242**

# Specification for Earthworks Construction

## 1. Scope

This specification covers the construction of earthworks including: the clearing and removal of all obstacles within the limits of the earthworks; Stripping of topsoil; excavation of all cuts, including excavation below the final subgrade surface; the excavation of borrow areas, benches, keyways and surface drainage facilities; the carting of excavated material to fill or waste; and construction of fills and subgrade; shaping, compacting, trimming and topsoiling. Any changes to the construction of the pond must be discussed with the certifier and any changes to the original plan will be confirmed in writing.

## 2. Initial site meeting

At the first meeting on site the location of the pond will be confirmed and any hazards identified that would affect the construction. Contractors shall confirm that the equipment that will be used on the site is appropriate and has sufficient roll over protection to work on slopes. All underground services about the site are to be confirmed. ie power, telecom, water and drainage etc.

## 3. Construction progress and recording

The contractor shall retain sufficient records to show what work was constructed each day, and suitable photographs held to record this.

## 4. Pond set out

The pond shall be set out so that the final dimensions of the pond and the levels of the walls correspond to the plans to ensure that the full design capacity of the pond is achieved and that the pond operates as it is designed.

## 5. Clearing

The area contained by the limits of the earthworks and any additional area shown on the drawings shall be cleared of all obstructions. Clearing shall include the complete removal vegetation, all liquid and solid effluent from the existing pond and disposal by dumping, burying or spreading as required.

## 6. Removal of topsoil

Topsoil shall be removed to outside of the top of the pond wall. Care shall be taken to avoid contamination of the structural fill material below the topsoil layer.

## 7. Surface drainage

Adequate provision shall be made for the control of surface water within the construction area to safeguard the integrity of the works. The earthworks shall be carried out in such a manner that their surfaces have at all times a sufficient fall to shed water and prevent flooding. No silt contaminated water shall be pumped into any open drain but spread to pasture to filter silt prior to entering an open drain.

## 8. Excavation

Excavation and reshaping the existing wall shall be carried out in such a manner to avoid mixing of the materials if they are to be used for lining the pond rather than for the construction of the walls. Excavation shall be carried out so as to limit overbreak as far as is practical.

## 9. Unforeseen irregularities

If during excavation any of the following are exposed, the method of resolving the irregularities are to be discussed with the certifier and the best option to remove or modify the excavation confirmed. These may include mole or tile drains, under runners, sand or gravel inclusions, bog wood, trees or rubbish pits.

## 10. Keyway construction

On all walls of the pond that are to be constructed a keyway shall be constructed to a minimum depth of 600mm deep and 2m wide. The backfill to the keyways shall be compacted as detailed in section 14.

## 11. Filling

The earthworks shall be managed in such a manner that the best material for clay lining is reserved for placement on the inside of the main storage pond. The location of this material shall be discussed with the certifier. The material used in fill shall be spread and compacted in layers of uniform quality and thickness. The thickness of each layer shall be limited to ensure that the specified compaction is achieved for the full depth of each layer. The movement of construction traffic shall be even distributed over the full width of the filling area, so as to avoid damage or overstress the compaction. If material which has already been placed in fill is considered by the certifier to be too wet then, the Contractor shall either dry or mix the material so that it is suitable for fill or excavate the material to waste and replace it with suitable material.

## 12. Compaction Methods

The Contractor shall submit to the certifier details of the proposed compaction methods and details of the compaction equipment before filing commences.

## 13. Layer Thickness

The maximum thickness of each layer of fill before compaction shall be 200mm

## 14. Compaction

Compaction of each layer shall continue until the whole layer has obtained a dense condition. The degree of compaction of each layer shall be such that when trimmed to a smooth surface, the resultant impression in the surface under a smooth wheel roller having a minimum loading of 6260kg per metre width of fill shall not be greater than 5 mm. The maximum dry density achieved shall be 92%. This will require a minimum number of four passes over the total fill area and all layers. The cut back wall surfaces shall be tightened with vibrating plate. Construction will be accepted on the basis of an area at a time. Each area offered for acceptance shall consist of material which is basically the one soil type which appears to be constant moisture content and which has received a uniform number of roller passes. The Certifier or his representative shall determine the locations of tests within each area. Test results shall be analysed in groups of five. When drying is necessary it shall be carried out to allow the full depth of the layer to dry uniformly. Drying and compaction shall be carried out under favourable weather conditions. Compaction shall not continue if the material shows signs of heaving or weaving excessively. In this situation the material shall be either left to dry naturally or where job progress would be affected by delay the material shall be dried to a moisture content at which heaving and weaving does not occur.

## 15. Disturbance and working of cut surfaces

Where the pond is cut into the existing clay subgrade that is of suitable quality for pond lining, it shall be scarified to a depth of 300mm and re compacted to provide a dense tight surface to the same density as any other compacted surface.

## 16. Synthetic lining

Prior to lining the pond, Bidim A29 or equivalent geotextile must be installed. The Liner shall be 1.5mm HDPE to GRI – GM13. The geotextile and synthetic lining for the storage pond shall be installed by a qualified installer and provide the quality assurance documentation to provide a 20 year warranty for the liner.

## 17. Finished surface slopes

The pond walls shall be shaped to a maximum slope of two horizontal to one vertical or flatter. All outside top of walls shall be sloped to shed water to the outside of the storage pond or sludge beds so that excess stormwater does not enter the ponds

## 18. Trimming and rolling

The entire surface of the inside of the pond shall be made firm, uniform and smooth by blading, grading and rolling. Rolling associated with the surface finishing shall be the same as that which would produce the compaction for that material type.

## 19. Surface water channels

All areas where the existing ground surface slopes toward the ponds a shallow surface water channel shall be constructed as shown on the plans. This will lead water away from the pond to a suitable outfall.

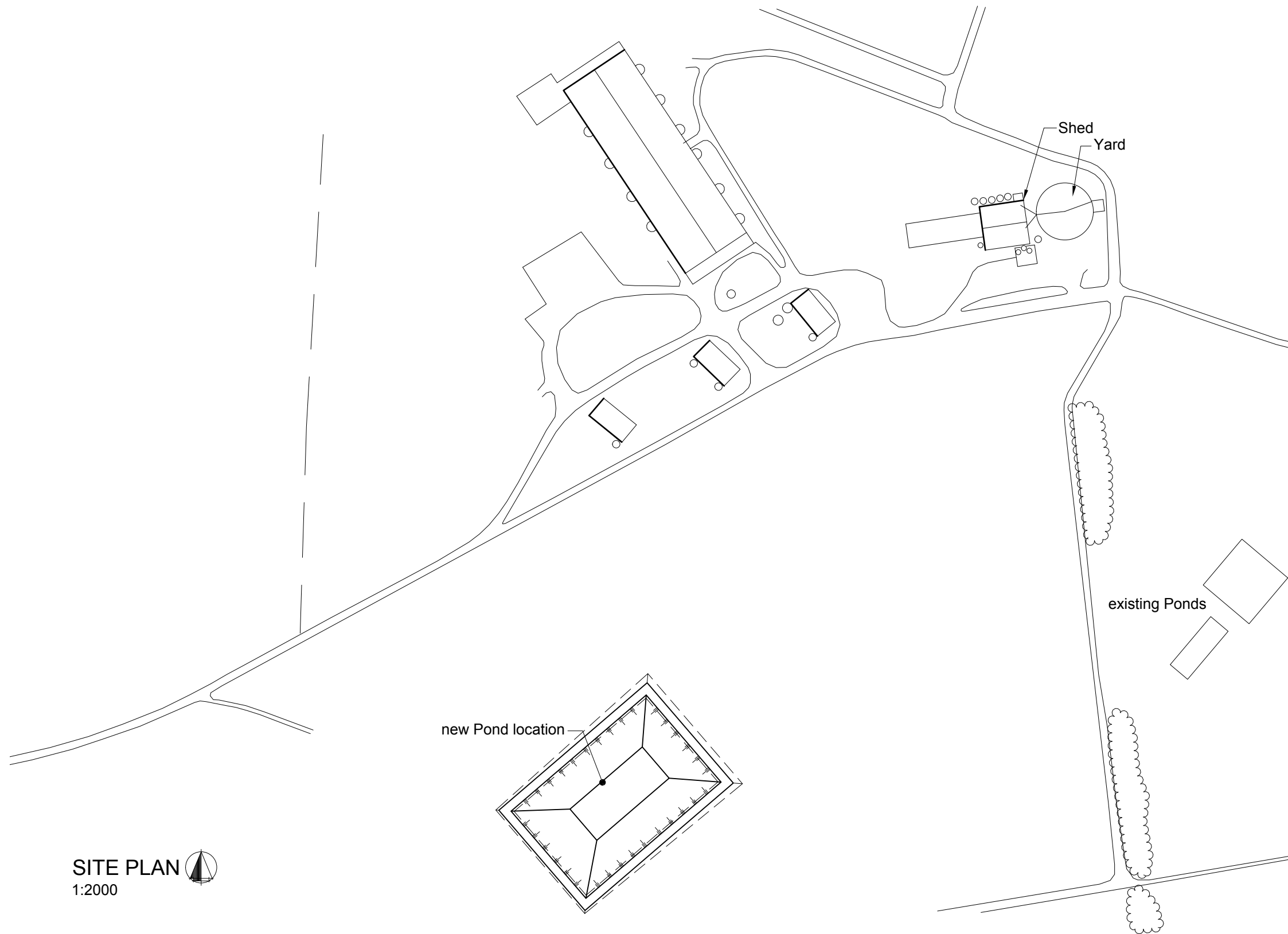
## 20. Topsoiling

Topsoil shall be re spread to provide smooth and natural transitions between the ponds and the surrounding pasture areas. The topsoil shall be worked and trimmed to a tilth suitable for typical farm machinery to finish suitable for grass. The outside batters shall be topsoiled and sloped so that they can be cultivated, sown with grass and mown if required.

## 21. Fencing

Fencing, although required on all ponds, shall not be the responsibility of the contractor or certifier.

Note:  
 This design is site specific and is not to be used for other similar projects unless permission has been obtained in writing from Civil Tech Limited.



SITE PLAN  
 1:2000

A	12/21	issued for construction
REV:	DATE:	DESCRIPTION:
DESIGNED:	M Gardyne	DATE: 12/21
DRAWN:	hb	DATE: 12/21
CHECKED:	MG	DATE: 12/21
APPROVED:	MG	DATE: 12/21
		ORIGINAL SIZE: A3
		SCALE: as shown @A3

**civil tech**<sup>ltd</sup>  
 PO Box 1558 Invercargill  
 Phone: 03 216 9745  
 Mobile Phone: 027 435 7957

CLIENT:  
**CAPIL GROVE LTD**

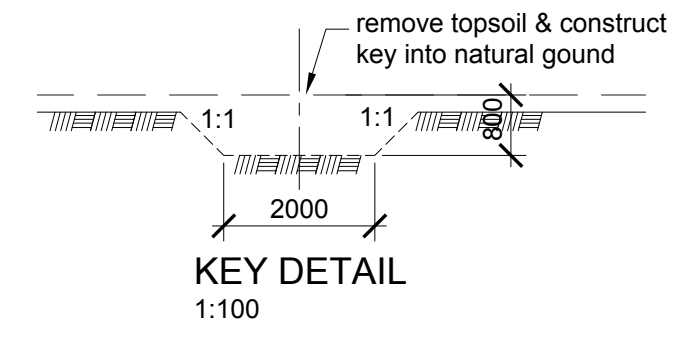
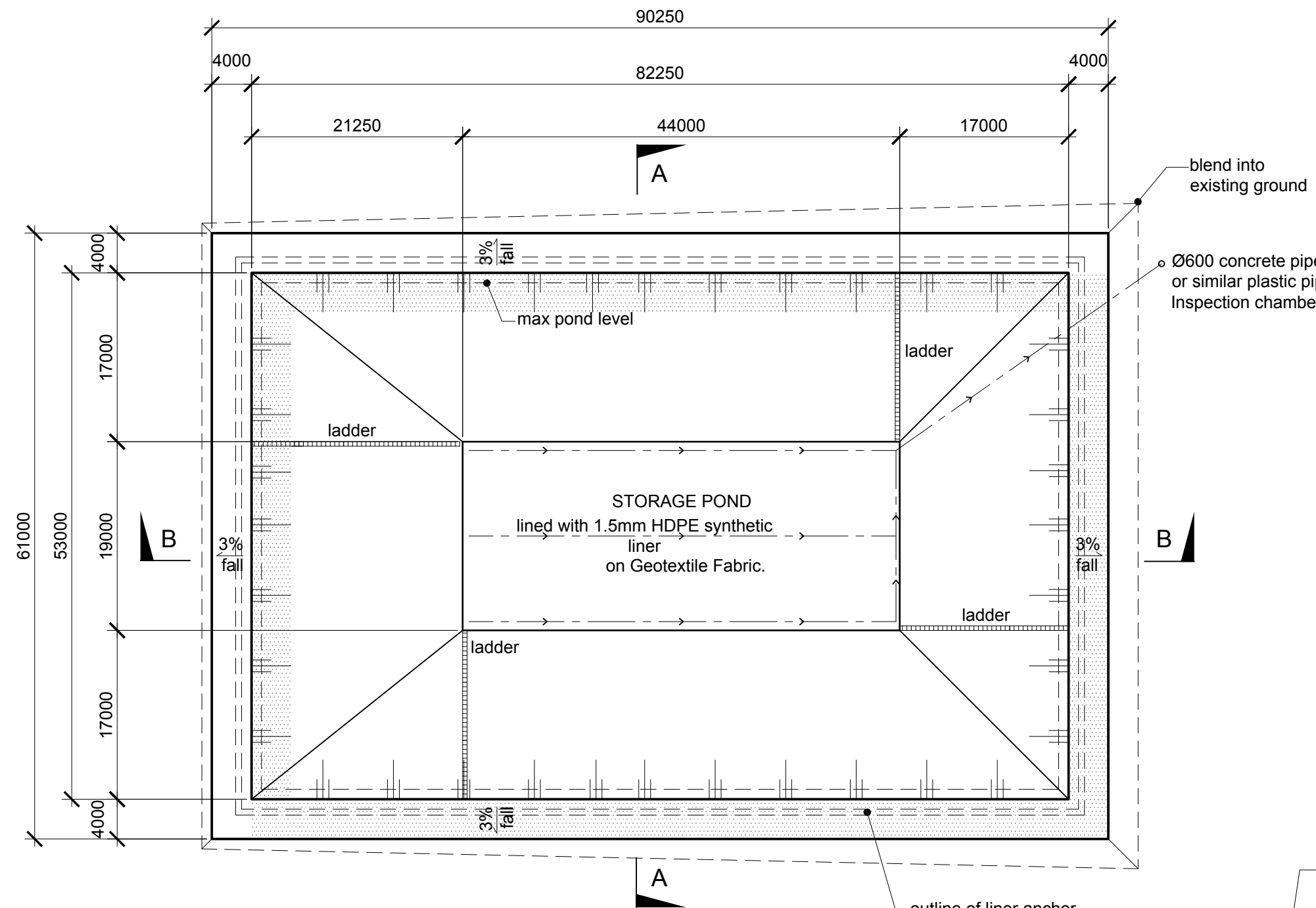
DRAWING TITLE:  
**ADDITIONAL COLLECTED AGRICULTURAL EFFLUENT STORAGE POND**

DRAWING NUMBER: 1242 C01	REVISION: A
-----------------------------	----------------

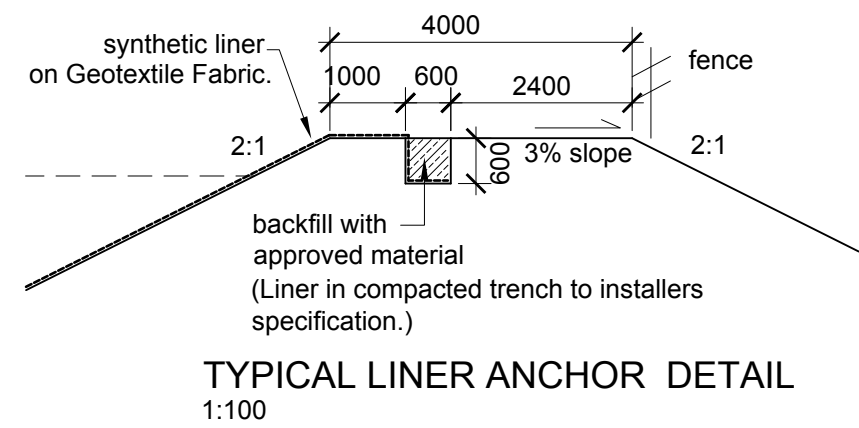
DO NOT SCALE - IF IN DOUBT ASK

FILE NO. 2021

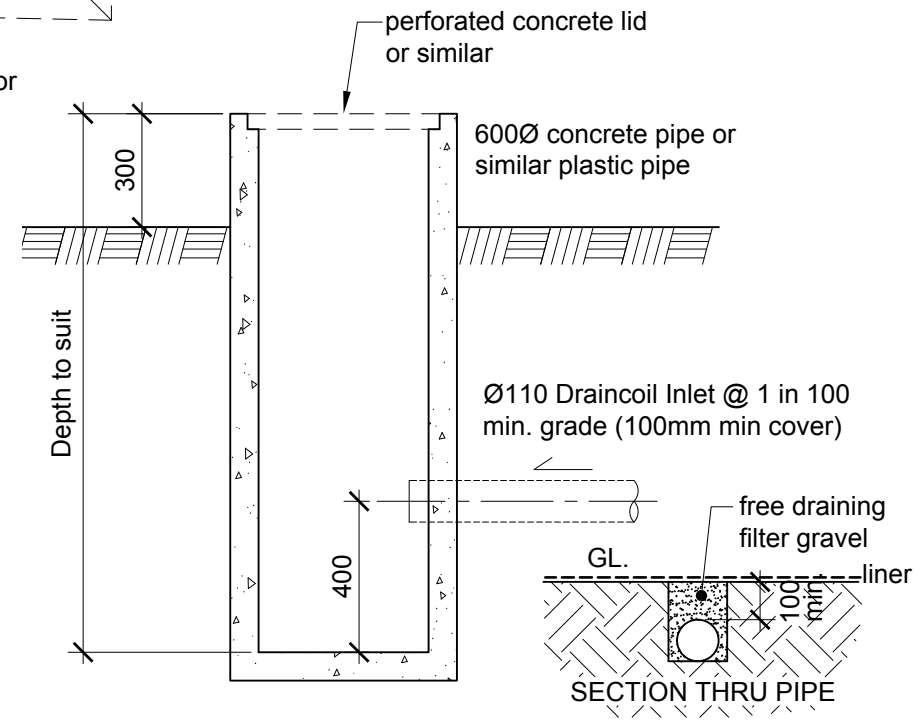
Note:  
This design is site specific and is not to be used for other similar projects unless permission has been obtained in writing from Civil Tech Limited.



**STORAGE POND PLAN**  
1:500  
Allow for safety fence around ponds



**TYPICAL LINER ANCHOR DETAIL**  
1:100



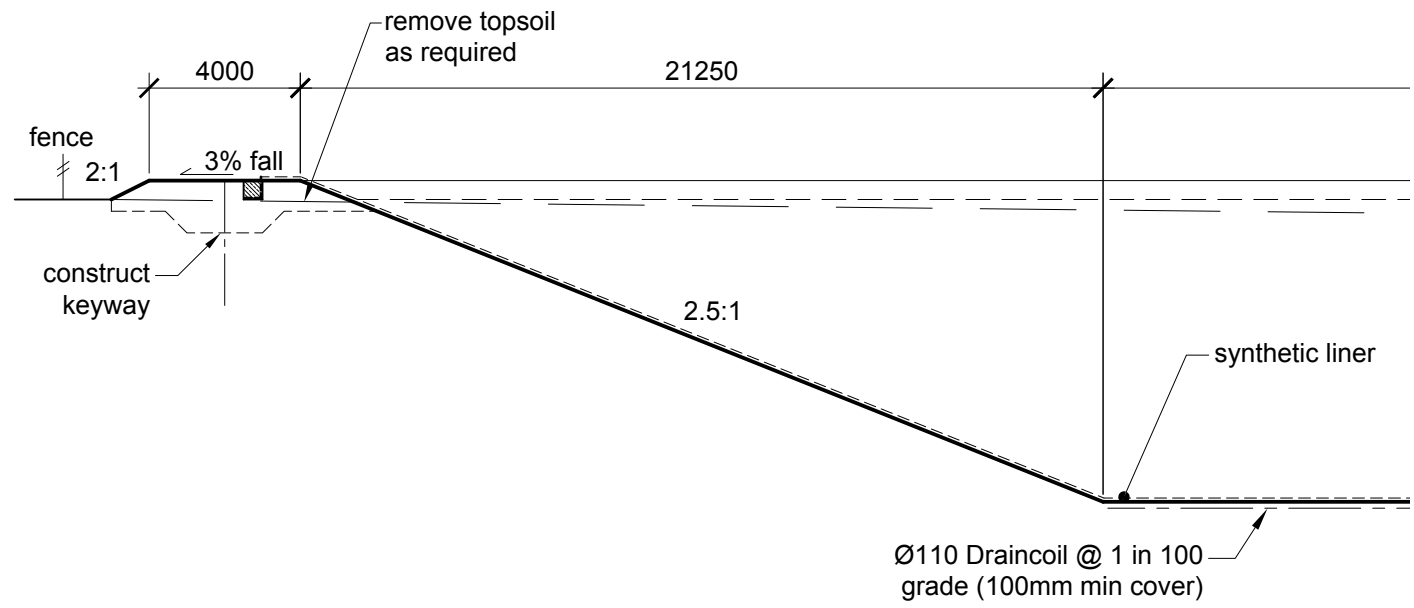
**INSPECTION CHAMBER DETAIL**  
1:20

DESIGNED:	M Gardyne	DATE:	12/21	ORIGINAL SIZE:	A3
DRAWN:	hb	DATE:	12/21	SCALE:	as shown @A3
CHECKED:	MG	DATE:	12/21		
APPROVED:	MG	DATE:	12/21		
 <b>civil tech<sup>td</sup></b> PO Box 1558 Invercargill Phone: 03 216 9745 Mobile Phone: 027 435 7957					
CLIENT:					
CAPIL GROVE LTD					
DRAWING TITLE:					
ADDITIONAL COLLECTED AGRICULTURAL EFFLUENT STORAGE POND					
DRAWING NUMBER:				REVISION:	
1242 C02				A	

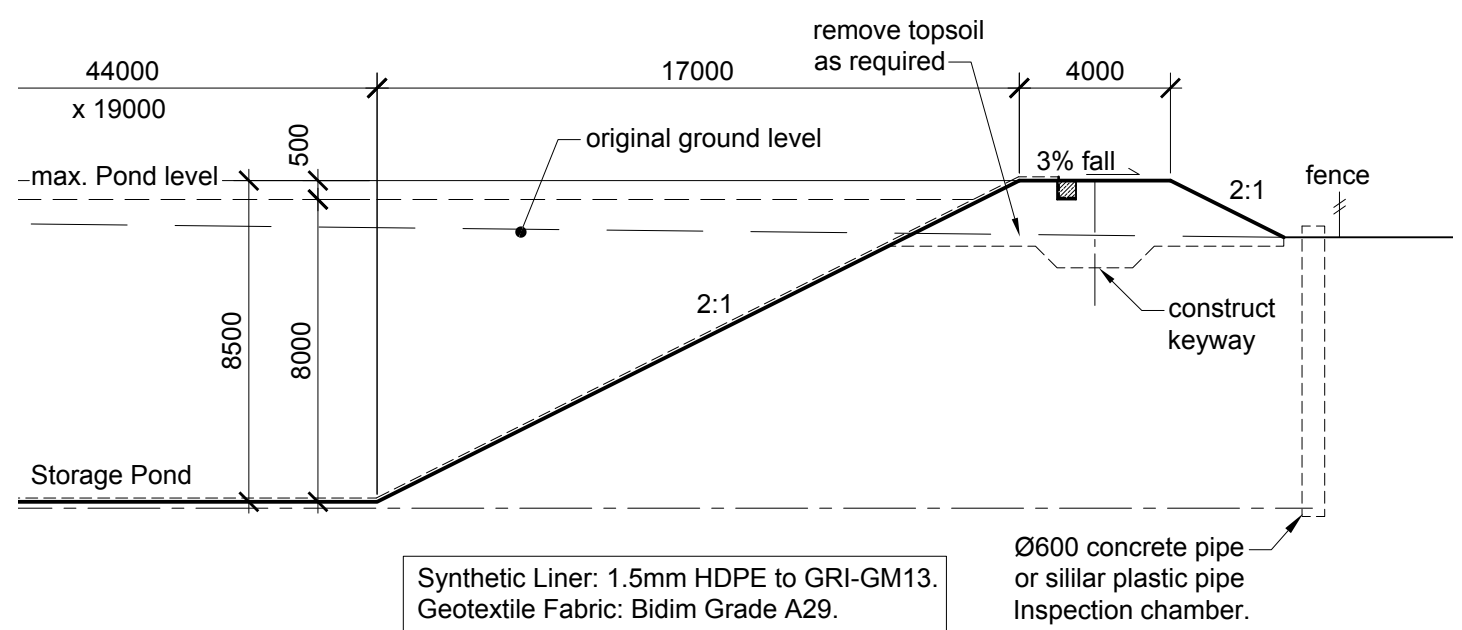
DO NOT SCALE - IF IN DOUBT ASK

FILE NO. 2021

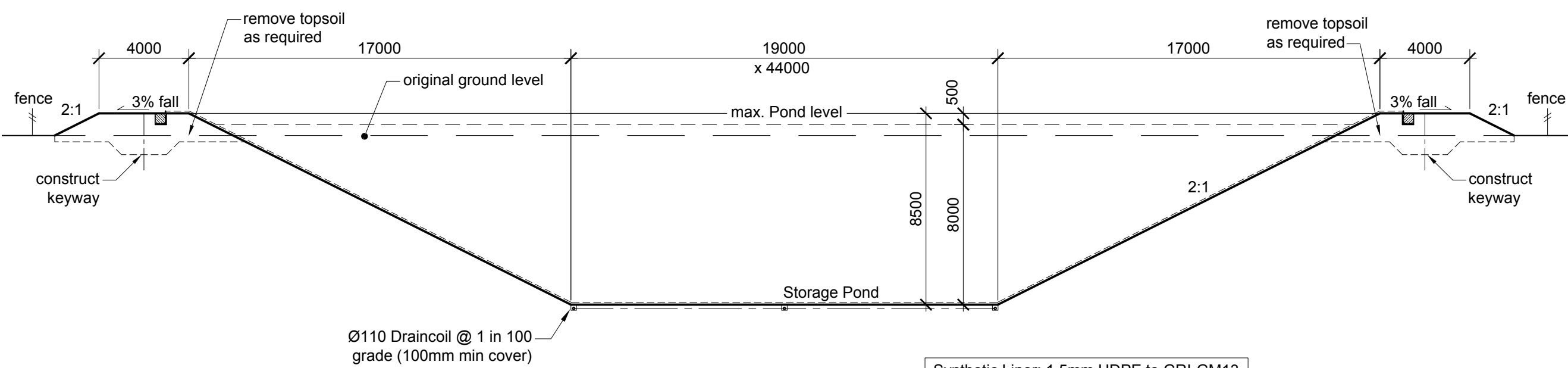
Note:  
This design is site specific and is not to be used for other similar projects unless permission has been obtained in writing from Civil Tech Limited.



TYPICAL CROSS SECTION B-B  
1:200



Synthetic Liner: 1.5mm HDPE to GRI-GM13.  
Geotextile Fabric: Bidim Grade A29.



TYPICAL CROSS SECTION A-A  
1:200

Synthetic Liner: 1.5mm HDPE to GRI-GM13.  
Geotextile Fabric: Bidim Grade A29.

DESIGNED:	M Gardyne	DATE:	12/21	ORIGINAL SIZE:	A3
DRAWN:	hb	DATE:	12/21	SCALE:	as shown @A3
CHECKED:	MG	DATE:	12/21		
APPROVED:	MG	DATE:	12/21		
 <b>civil tech</b> <sup>td</sup> PO Box 1558 Invercargill Phone: 03 216 9745 Mobile Phone: 027 435 7957					
CLIENT:					
CAPIL GROVE LTD					
DRAWING TITLE:					
ADDITIONAL COLLECTED AGRICULTURAL EFFLUENT STORAGE POND					
DRAWING NUMBER:				REVISION:	
1242 C03				A	

DO NOT SCALE - IF IN DOUBT ASK

FILE NO. 2021





# **Appendix E**

## **Dairy Effluent Storage Calculator – Stage 4**

## Disclaimer

I/We acknowledge and agree that:

1. the results contained in the report which DairyNZ will provide following my/our use of the Dairy effluent storage calculator ("the calculator") are generated based on the data which I/we have inputted into the calculator; and
2. the reliability of the results and the report is dependent upon a number of variables including, without limitation, the accuracy of the input data, and the validity of the assumptions and algorithms used in the calculator in relation to the input data which may be updated to reflect development in effluent knowledge; and
3. the results contained in the report cannot be relied upon solely to ensure the effluent storage system:
  - a. meets the current or future requirements of the district or regional plans of the local territorial authority or regional council or any other authority having jurisdiction.
  - b. has the storage capacity to allow practical management of the effluent system.

**Accordingly, DairyNZ does not accept liability for any loss, damage, cost or expense suffered or incurred by me/us or any third party to whom this report has been provided (whether by me/us or another person) in connection with the use of, and reliance on, the report and the results contained in it.**

DairyNZ's website terms and conditions (which can be found at <https://www.dairynz.co.nz/terms-and-conditions>) otherwise apply to the use of this service and the provision of the report and the results in it.

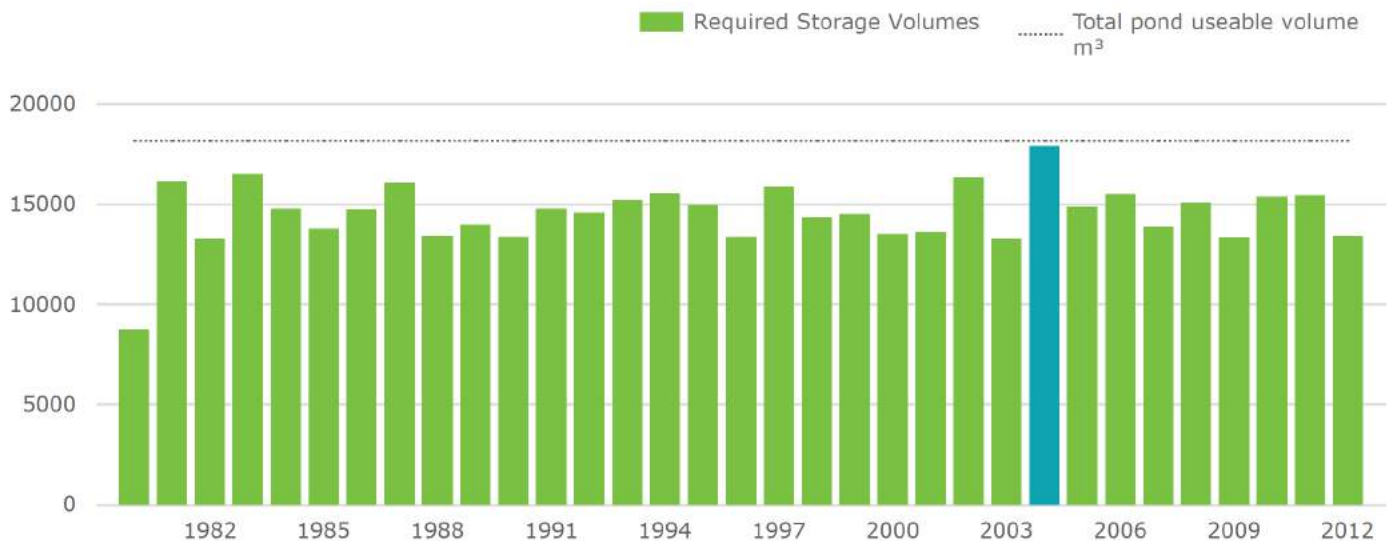
## Farm 444 DESC - Stage 4

444 Springhills-Tussock Creek Road

<b>Supplier Number</b>	
<b>Storage max m<sup>3</sup></b>	17,902.36
<b>90th percentile m<sup>3</sup></b>	16,136.67
<b>Total pond useable volume m<sup>3</sup></b>	18,180.00
<b>File owned by</b>	Victoria Jones
<b>Created by</b>	Victoria Jones
<b>Created on</b>	16 Nov 2021
<b>Last modified by</b>	Victoria Jones
<b>Last modified on</b>	08 Feb 2022

Stage 4 - No lease, new effluent pond, new winter barn, 200 cows from Capil Grove. 16,136 m<sup>3</sup> required for 640 cows from 444 Farm (milking year round) and 200 cows from Capil Grove Farm (wintering in barn) at 5 mm depth (if not applying effluent Mid May- Mid Sep).

## Required Storage Volumes



## Climate

Site	Mean Rainfall mm	Altitude m
Winton	958	44

**Soil**

<i>Low Risk Soil ha</i>	<i>Minimum High Risk Soil ha</i>	<i>Surplus high risk soil ha</i>
0	340	315

**Irrigation**

<i>Calculated option</i>	<i>Application depth mm</i>	<i>Pump volume m<sup>3</sup></i>
Specified	5	200

**Solid Storage Volumes**

No Data Available

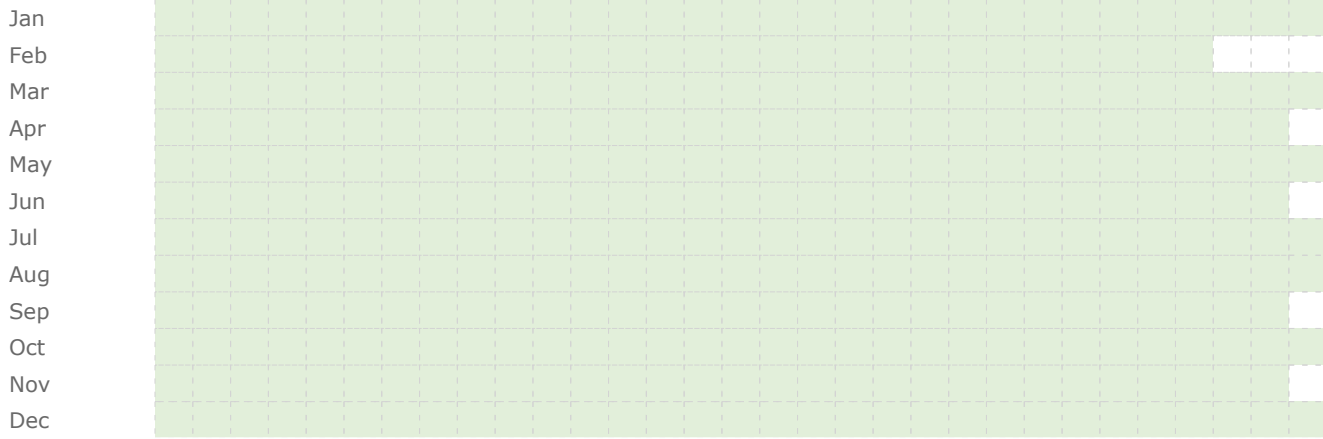
**Catchment**

<b>Shed</b>		<b>Yard</b>		<b>Feedpad</b>			<b>Animal Shelter</b>			<b>Other</b>
Area m <sup>2</sup>	Diverted	Area m <sup>2</sup>	Diverted	Area m <sup>2</sup>	Covered	Diverted	Area m <sup>2</sup>	Covered	Diverted	Area m <sup>2</sup>
404	Yes	970	No	0	No	No	8240	Yes	Yes	0

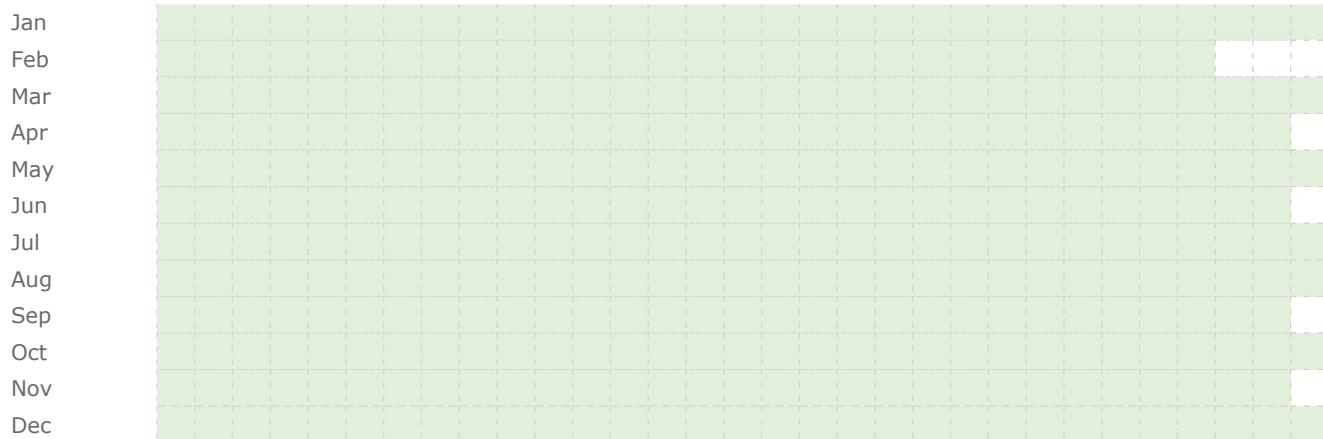
	<b>Yard</b>				<b>Animal Shelter</b>		
	Cows	Hours	Volume m <sup>3</sup>	Wash LCD	Cows	Hours	Volume m <sup>3</sup>
Jan	640	6	32	50	0	0	0
Feb	640	6	32	50	0	0	0
Mar	640	6	32	50	0	0	0
Apr	640	6	32	50	0	0	0
May	640	6	32	50	840	20	0
Jun	640	6	32	50	840	24	0
Jul	640	6	32	50	840	24	0
Aug	640	6	32	50	840	24	0
Sep	640	6	32	50	840	20	0
Oct	640	6	32	50	0	0	0
Nov	640	6	32	50	0	0	0
Dec	640	6	32	50	0	0	0

**Calendar**

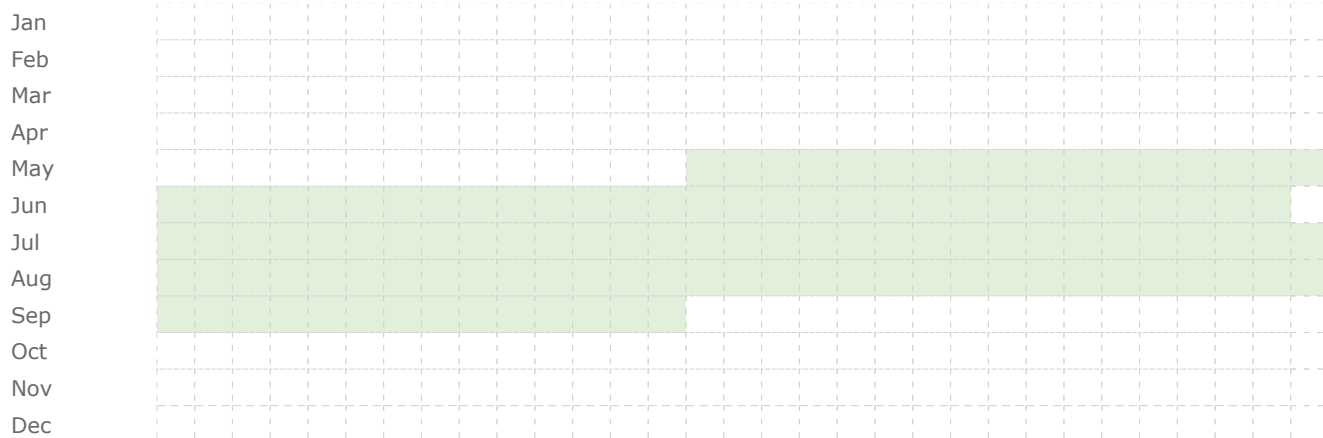
**Milking**      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



**Animal Shelter Diversion**      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



**Non Irrigation**      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



**Solid Unit**

No Data Available

**Storage**

Emergency Storage Period 0

<i>Storage Name</i>	<i>Covered</i>	<i>Pumped</i>	<i>Type</i>	<i>Dimension</i>
Weeping Wall	No	On	Regular - Rectangular	length 16m, width 18m, height 1m, sludge height 0.9m freeboard height 0.1m and batter 1:1
New Pond	No	On	Regular - Rectangular	length 82.25m, width 53m, height 8.5m, sludge height 0.5m freeboard height 0.5m and batter 2:1

## Appendix

<i>Season</i>	<i>Required Storage Volumes m<sup>3</sup></i>
1980	8,751.70
1981	16,150.07
1982	13,273.39
1983	16,486.68
1984	14,763.06
1985	13,763.38
1986	14,725.03
1987	16,083.04
1988	13,437.88
1989	13,976.65
1990	13,372.81
1991	14,754.18
1992	14,569.52
1993	15,225.54
1994	15,534.25
1995	14,948.38
1996	13,352.89
1997	15,901.79
1998	14,353.32
1999	14,524.38
2000	13,514.37
2001	13,608.43
2002	16,346.60
2003	13,254.94
2004	17,902.36
2005	14,865.63
2006	15,495.98
2007	13,867.81
2008	15,074.44
2009	13,316.72
2010	15,366.52
2011	15,437.96
2012	13,438.07



# **Appendix F**

## **Dairy Effluent Storage Calculator – Stage 2**



## Disclaimer

I/We acknowledge and agree that:

1. the results contained in the report which DairyNZ will provide following my/our use of the Dairy effluent storage calculator ("the calculator") are generated based on the data which I/we have inputted into the calculator; and
2. the reliability of the results and the report is dependent upon a number of variables including, without limitation, the accuracy of the input data, and the validity of the assumptions and algorithms used in the calculator in relation to the input data which may be updated to reflect development in effluent knowledge; and
3. the results contained in the report cannot be relied upon solely to ensure the effluent storage system:
  - a. meets the current or future requirements of the district or regional plans of the local territorial authority or regional council or any other authority having jurisdiction.
  - b. has the storage capacity to allow practical management of the effluent system.

**Accordingly, DairyNZ does not accept liability for any loss, damage, cost or expense suffered or incurred by me/us or any third party to whom this report has been provided (whether by me/us or another person) in connection with the use of, and reliance on, the report and the results contained in it.**

DairyNZ's website terms and conditions (which can be found at <https://www.dairynz.co.nz/terms-and-conditions>) otherwise apply to the use of this service and the provision of the report and the results in it.

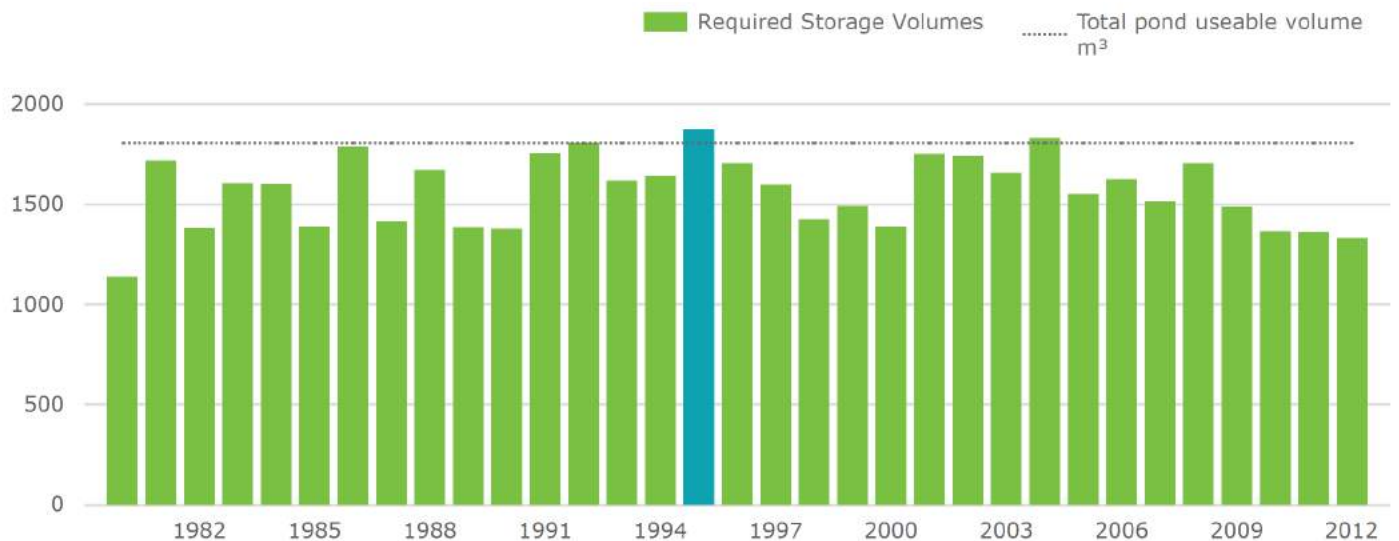
## Farm 444 - Stage 2

444 Springhills-Tussock Creek Road

<b>Supplier Number</b>	
<b>Storage max m<sup>3</sup></b>	1,874.52
<b>90th percentile m<sup>3</sup></b>	1,781.34
<b>Total pond useable volume m<sup>3</sup></b>	1,805.49
<b>File owned by</b>	Victoria Jones
<b>Created by</b>	Victoria Jones
<b>Created on</b>	01 Feb 2022
<b>Last modified by</b>	Victoria Jones
<b>Last modified on</b>	09 Feb 2022

Stage 2 of the proposal: 220 cows being milked. It is expected that the new pond will be installed before the following year which is why January - April haven't been accounted for.

## Required Storage Volumes



## Climate

Site	Mean Rainfall mm	Altitude m
Winton	958	44

**Soil**

<i>Low Risk Soil ha</i>	<i>Minimum High Risk Soil ha</i>	<i>Surplus high risk soil ha</i>
0	341	280

**Irrigation**

<i>Calculated option</i>	<i>Application depth mm</i>	<i>Pump volume m<sup>3</sup></i>
Specified	5	200

**Solid Storage Volumes**

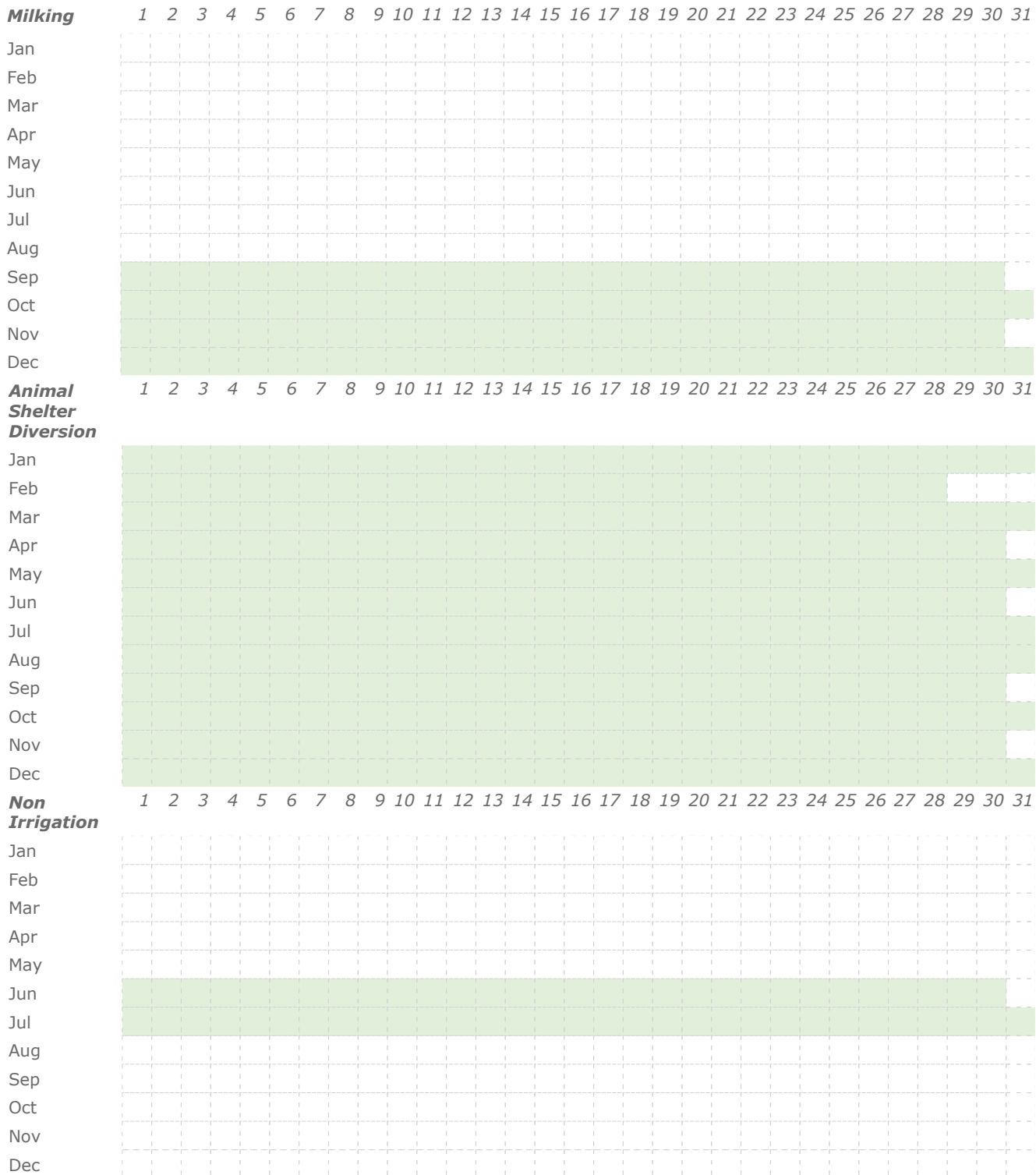
No Data Available

**Catchment**

<b>Shed</b>		<b>Yard</b>		<b>Feedpad</b>			<b>Animal Shelter</b>			<b>Other</b>
Area m <sup>2</sup>	Diverted	Area m <sup>2</sup>	Diverted	Area m <sup>2</sup>	Covered	Diverted	Area m <sup>2</sup>	Covered	Diverted	Area m <sup>2</sup>
404	Yes	550	No	0	No	No	4950	Yes	Yes	0

	<b>Yard</b>				<b>Animal Shelter</b>		
	Cows	Hours	Volume m <sup>3</sup>	Wash LCD	Cows	Hours	Volume m <sup>3</sup>
Jan	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0
May	0	0	0	0	55	20	0
Jun	0	0	0	0	220	24	0
Jul	0	0	0	0	205	24	0
Aug	0	0	0	0	70	24	0
Sep	220	2	11	50	30	20	0
Oct	220	2	11	50	0	0	0
Nov	220	2	11	50	0	0	0
Dec	220	2	11	50	0	0	0

**Calendar**



**Solid Unit**

No Data Available

**Storage**

Emergency Storage Period 1

<i>Storage Name</i>	<i>Covered</i>	<i>Pumped</i>	<i>Type</i>	<i>Dimension</i>
Pond 1	No	On	Regular - Rectangular	length 26m, width 26m, height 3m, sludge height 0.31m freeboard height 0.4m and batter 2:1
Pond 2	No	On	Regular - Rectangular	length 26m, width 26m, height 2.8m, sludge height 0.45m freeboard height 0.3m and batter 2:1

## Appendix

<i>Season</i>	<i>Required Storage Volumes m<sup>3</sup></i>
1980	1,138.57
1981	1,717.78
1982	1,379.37
1983	1,605.46
1984	1,599.82
1985	1,388.32
1986	1,788.08
1987	1,411.21
1988	1,671.99
1989	1,383.35
1990	1,378.90
1991	1,754.35
1992	1,806.84
1993	1,616.83
1994	1,638.70
1995	1,874.52
1996	1,703.52
1997	1,597.03
1998	1,425.15
1999	1,487.93
2000	1,387.25
2001	1,751.12
2002	1,742.39
2003	1,656.10
2004	1,832.03
2005	1,551.68
2006	1,624.44
2007	1,514.27
2008	1,702.68
2009	1,486.61
2010	1,365.53
2011	1,362.21
2012	1,329.26



## **Appendix G**

### **Water Distribution Map**

