Consents Hearing
21 March 2023

Fawna Farms Limited – APP-20222565

Appendices

Attachment 1

Application

LANDPRO
Make the most of your land

6 October 2022

Landpro Reference: 22417
Council Reference: AUTH-20146434-01-V2 and AUTH-20202016

Environment Southland
Private Bag 90116
Invercargill, 9840

To whom it may concern

Re: Application by Fawna Farms Limited for expanded dairy activities.

Please find enclosed the above consent application for your consideration.

The applicant is seeking replacement resource consents for their existing dairy consents, including resource consents for expanded dairy.

We consider that the evidence on adverse effects would justify limited notification to To Ao Marama and Ngāi Tahu. However, the applicant appreciates there is public interest in applications of this nature and understands that Environment Southland has indicated that such applications (additional dairy platform land and additional cows) should be publicly notified. Therefore, to enhance the efficiency of the process, as the proposal is for expanded dairy activities, including additional land and cows, the applicant requests public notification.

The applicant requests a separate invoice be sent with details for consent deposit.

If you have any questions in relation to this application, please don't hesitate to contact me directly.

Kind Regards,

Christina Bright

Christina Bright
Environmental Consultant

0800 023 318
13 Pinot Noir Drive
PO Box 302
Cromwell 9342
Central Otago, NZ
info@landpro.co.nz
landpro.co.nz

PART A

Application for Resource Consent

This application is made under Section 88 of the Resource Management Act 1991 (Form 9)

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

1. **Applicant(s) Details**

A resource consent can only be held by a legal organisation or fully named individual(s).

1.1. Applicant's name (*full name of proposed consent holder*). *Please complete either (a) OR (b) to whom consent is to be issued*

	First Name	Middle Name	Surname
(a) Individual(s)			

OR

(b) Registered company name: Fawna Farms Limited

Company number: 8309980

1.2. Applicant's address *[not consultant's address]*

(a) Individual(s)

Postal Address ______

Email ______

Phone ______ Mobile ______ Fax ______

(b) Company

Contact Person: Simeon Ward

Postal Address ______

Email: wardpfe@gmail.com

Phone ______ Mobile: 027 313 0687 Fax ______

2. Consultant/ Agent details (if applicable)

Contact person: Christina Bright

Company: Landpro Ltd

Postal Address:

Email: christina@landpro.co.nz

Phone: ______ Mobile: 027 231 0749 Fax: ______

Note: *All correspondence during the consent process will be directed to this contact person, unless instructed otherwise. Final decision documents will be sent to the applicant.*

Are you the owner or occupier at the site? [X] Yes [ ] No

If not, please complete the following information

Name of owner or occupier at the site (*if different from 1.1.*) ______

Address of the owner or occupier at the site (*if different from 1.2.*) ______

2 Site Details

Location of activity (*including street/road name, number, and locality*): 1620 Ohai Clifden Highway

Map Co-ordinates (NZTM 2000)

1201663 E 4890884 N(NZTM 2000)

Legal description of property at site of activity (*refer to land title or rates notice*) ______

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

Lot 3 DP 340527; Pt Section 94 Waiau SD; Section 1 SO 452868; Section 18 Merrivale Settlement No 2; Pt Section 29 Blk IX Waiau SD; Pt Section 94 Waiau SD; Pt Section 94R Waiau SD; Pt Section 29 Blk IX Waiau SD; Section 16 Merrivale Settlement No 2; Section 110 Waiau SD; Pt Section 8 Blk IX Waiau SD; Lot 2 DP 7360; Lot 7 DP 7360; Lot 6 DP 7360; Lot 1 DP 7360; Lot 3 DP 7360; Lot 5 DP 7360; Lot 4 DP 7360; Section 250 Waiau SD

3. Consents required in relation to this proposal:

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

Water

	Take and use surface water		Divert water
X	Take and use groundwater		Dam water

Land Use

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

Discharge

	To air		To water
X	To Land		

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		

What is the purpose of this application?

New resource consent	X
Renew resource consent	X
Variation of conditions according to S 127 RMA	X
Certificate of compliance	

Are there any **current** or **expired** consents relating to this proposal? X Yes ☐ No

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

AUTH-20146434-01-V2 - Discharge effluent

AUTH-20202016 - To take groudnwater

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

X Yes ☐ No

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

Expanded dairy - Environment Southland
New dariy farm Land - National Environmental Standard for Freshwater, Environment Southland

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

Pre application advise- Have you discussed this proposal with a council staff member?

X Yes ☐ No

If yes, please provide name of staff member if known

Any further comments you would like to advise us about this application?

A site visit was undertaken with Bruce Halligan and George Gericke on 14th September 2022.

5 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.*

6 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.

7 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.

8 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

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

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.

9 Checklist: Have you included the following?

X	Payment of the required deposit *(see fee schedule)*
TBC	Written approval from all potentially affected parties *(forms available from the Environment Southland website*)
X	Site plan/location map/sketch of the proposed activity
X	A copy of the Certificate of Incorporation (*where applicant is a company*)
X	Part B form(s) specific to your activity and/or a separate assessment of environmental effects (AEE)

Notes:

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

(b) Under S35 of the Resource Management Act 1991 your application will be publicly available information and subject to the relevant provisions of the Local Government Official Information and Meetings Act 1987.

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) CHRISTINA BRIGHT

Signed Christina Bright. **Date** 06/10/2022

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

NEW ZEALAND COMPANIES OFFICE
COMPANIES REGISTER

Certificate of Incorporation

FAWNA FARMS LIMITED

8309980

NZBN: 9429050318360

This is to certify that FAWNA FARMS LIMITED was incorporated under the Companies Act 1993 on the 24th day of February 2022.

Registrar of Companies
6th day of October 2022

REGISTRAR OF COMPANIES NEW ZEALAND

Certificate generated 06 October 2022 11:40 AM NZDT

Resource Consent Application to Environment Southland

Prepared for Fawna Farms Ltd

Prepared For

Fawna Farms Ltd

Prepared By

Landpro Ltd
13 Pinot Noir Drive
PO Box 302
Cromwell
Tel +64 3 445 9905

QUALITY INFORMATION

Reference: C:\12dS\data\SERVER2008R2\22417-Fawna Farms Ltd - Dairy Consents_5118\Planning\Fawna Farms Ltd - AEE for Dairy Consents.docx

Date: 7 October 2022

Prepared by: Christina Bright

Reviewed by: Mike Freeman

Client Review: Fawna Farms Ltd

Version Number: Final

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Fawna Farms Ltd dairy farm is 370.9 ha and has a consent to peak milk 900 dairy cows on-site. A neighbouring and adjoining 454.6 ha farm has been purchased by IFS Growth Limited – a forestry management and investment company. The IFS Growth property is currently operated as a dairy support, sheep, and beef trading property. Fawna Farms Ltd is in the process of purchasing a 165.9 ha block of land from IFS Growth.

The IFS Growth block is of mixed contour and soils. Fawna Farms and IFS Growth have considered the specific surface water quality issues in the existing environment and the likely contaminant pathways (and physiographic characteristics) relevant to local water quality issues and have prepared a resource consent application for expanded dairy activities that will result in de-intensification over their new larger landholding. The two landowners through preparing this application have carefully considered the direction of travel required in Southland to achieve Southland's aspirations for freshwater in the future, and in particular the recommendations of the Regional Forum and the Ngāi Tahu ki Murihiku Freshwater Objectives. An assessment has been undertaken to identify the environmental risk areas on the IFS Growth property and the best long term sustainable use of the property.

The proposal on the IFS Growth block is to:

1. Retire the steeper contour land from pastoral farming and establish a 288.7 ha forestry block.
2. The remaining 165.9 ha will be subdivided off by IFS Growth and sold to Fawna Farms Ltd to incorporate into their dairy farm.

A conditional agreement is in place between the two landowners whereby the retirement of the 288.7 ha block from grazing and benefits are provided from the carbon and nutrient offset this provides. This approach is only economically viable through sale of the remaining high-value pastoral land to Fawna Farms Ltd. Therefore, the proposed retirement of 288.7 ha and planting of trees and change in farm system with dairy expansion are closely linked.

The proposed water quality contaminant reductions will be achieved through the planting of exotic trees and improvements in farming practices. All the land subject to this proposal is located within the Waiau Catchment, near Ohai.

The proposed dairy expansion (Figure 2) by Fawna Farms is covered by this resource consent application.

The proposed Fawna Farms dairy expansion includes increasing the milking platform by 165.9 ha which includes 24 ha of QE2 covenant and would be excluded from dairy grazing. This will enable the farm to become self-contained for wintering. Being self-contained means the consent holder has full control and would not rely on third party contracts to winter stock elsewhere in the catchment or region. It is proposed to increase the peak herd number from 900 to 1,200 cows.

The proposed IFS Growth forestry block will not only retire land from pastoral farming but also remove winter cropping from this higher risk portion of the property.

OverseerFM nutrient budgets have also been prepared and are supported by good management practices and bespoke mitigations which are being proposed. These mitigations support the nutrient offset achieved by the forestry block development. We have assessed the effectiveness and appropriateness of these changes at the local farm scale, the key contaminant pathway risks, and the contribution that these measures would provide to water quality improvements at the catchment scale.

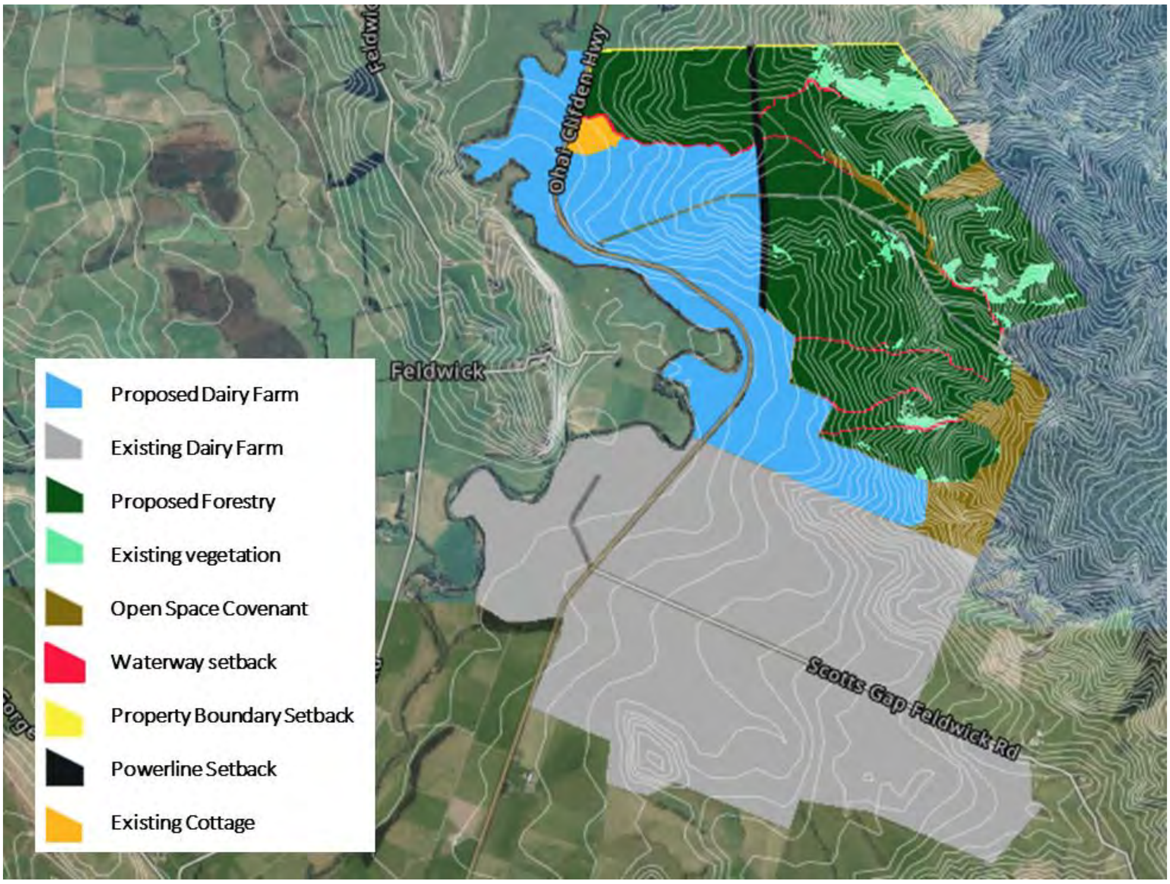


Figure 1: Location of existing dairy farm and the new 165.9 ha of flatter contour land to be added to the dairy platform and remaining 288.7 ha planted in trees.

The larger of the QE2 blocks (24 ha) is part of the 165.9 ha that is proposed to be subdivided and sold to Fawna Farms Ltd. Therefore, of the 165.9 ha block, only 141.9 ha of that is proposed for use as dairy farm, with the current QE2 covenant remaining.

Figure 2 provides an overview of the proposed subdivision and land sale, and the agreement between IFS Growth and Fawna Farms.

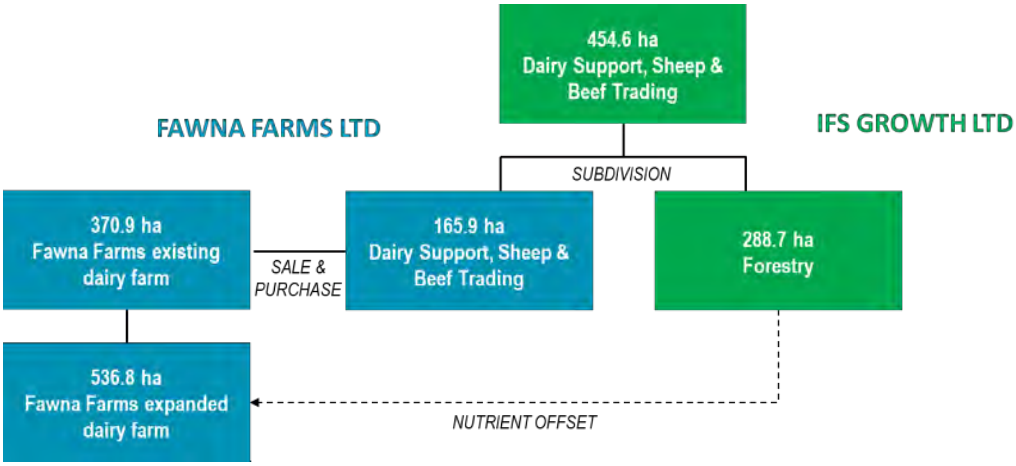


Figure 2: Proposed subdivision of land with establishment of forestry block and expanded dairy farm.

Offsetting is not an uncommon resource management approach; however, the landowners appreciate that the proposal prepared by Fawna Farms and their agreement with IFS Growth is a unique approach to achieve catchment water quality goals and hauroa within the Waiau Catchment. Therefore, the landowners propose a consent condition that the planting of the 288.7 ha block in forestry is completed before expanded dairy activities can commence.

It is anticipated that the collaborative approach between these two landowners will ensure that the mitigations proposed make a meaningful contribution to local water quality within the catchment over time where contaminants originate from overland flow pathways from pastoral farming on steep contour land, and work towards achieving a state of hauora.

This proposal is climate change positive. The new forest will be entered into the Emissions Trading Scheme (ETS) under the 'averaging scheme' and contribute to meeting New Zealand's climate change obligations. IFS Growth will be able to claim Carbon Credits for the first 16 years of the forests life and thereafter the forest will continue to accrue credits and will be managed as a pure production forest for log and wood fibre. The 'averaging scheme' was enacted by the Government to promote new afforestation, with the ultimate goal of this carbon storage coupled with emitter decarbonisation enabling New Zealand to reach a carbon neutral position.

In additional to the application being carbon positive, the estimated total agricultural emissions for the proposed farming system are more than 10% lower than the current land use primarily because of the reduction in total stock units (RSU) being farmed. This represents a positive shift to farming with less greenhouse gas emissions, and de-intensification overall.

There will be ongoing obligations in relation to greenhouse gas emissions, and through the likes of He Waka Eke Noa there will be pathways available for agricultural emitters to capture the benefits of changes made on farm. The proposal has not accounted for current, and future mitigations on farm although it is broadly acknowledged through this application that there will be carbon sequestration, and agricultural greenhouse gas emission benefits.

When forestry is harvested and not replanted, the forest owners have obligations under the ETS to pay carbon credits (the liability of paying the carbon credits back is currently so significant it not advantageous to remove forestry without replanting) or offset this forest clearance and the liability by planting a new forest. This gives permanence to the use of this land for forestry. Furthermore, the National Environmental Standard for Freshwater now includes resource consent requirements to convert forest to pastoral land use. Therefore, in addition to proposed consent condition, see Section 2.3, the above are reasons for why the forestry block will remain in use as plantation forestry and can be relied upon as a permanent reduction in nutrient load to the catchment.

The proposal includes nutrient budgets that estimate the nitrogen and phosphorus losses from the landholding in the year ending 2020 period and the proposed farm systems. The year ending 2020 is the sum of losses from the Fawna Farms dairy farm and the IFS Growth block as dairy support, beef trading and sheep property. The proposed system is the sum of the losses from the expanded Fawna Farms dairy farm and the IFS Growth forestry block, combined.

Overall, the models predict a 6.8% reduction in nitrogen and 39.4% reduction in phosphorus for the proposed expanded Fawna Farms dairy farm and IFS forestry block in comparison to the year ending 2020 land use. These reductions are the result of the below mitigations:

- A reduction in grazed area due to conversion to forestry
- Reduction in fertiliser applied on winter crops.
- Decrease in phosphorus fertiliser use.
- Overall reduction in stocking capacity as measured by RSU[1] across the entire landholding.
- Reduction in RSU per hectare on the original Fawna Farms dairy area
- Increase in effluent disposal area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed.
- Removal of stock access to waterways.

Other proposed mitigations not rewarded through the OverseerFM model include:

- A 10m buffer from all waterways to winter forage crops (grazed 1 May to 30 September), where the buffer will be uncultivated and retained in pasture.
- Planting of 5.5ha area between dairy shed and Gap creek.
- Buffers applied in new forestry block between existing vegetation, and waterways.

[1] RSU means revised stock unit and is defined as an animal with an intake of 6,000 MJ ME intake per year. RSU is useful for assessing and comparing a farm's carrying capacity, i.e., how intensive a farm is, or the number of animals that can be grazed in a certain period. This enables the carrying capacity of dairy and non-dairy systems to be compared.

1. INTRODUCTION

1.1 Overview of Proposal

Fawna Farms Ltd (the applicant) own and operate a 370.9 ha dairy farm with consent to peak milk 900 dairy cows on-site. A neighbouring and adjoining 454.6 ha farm has been purchased by IFS Growth Limited – a forestry management and investment company. The IFS Growth property is currently operated as a dairy support, sheep, and beef trading property. Fawna Farms Ltd is in the process of purchasing a 165.9 ha block of land from IFS Growth and is proposing to incorporate this block in their existing dairy farm.

The balance land of 288.7 ha of land to be planted in forestry, *Pinus radiata*, by IFS Growth Ltd, see Figure 1 in Executive Summary above and Figure 2 for map of different blocks of land.

The applicant proposes to incorporate the165.9 ha block into their existing 370.9 ha property (including a maintained 24 ha block of QE2 covenant land) and allow for an increase in peak number of cows milked from 900 to 1,200 cows. The 288.7 ha forestry block is proposed as a contaminant loss offset for the proposed dairy expansion and the applicant proposes to not commence expanded dairy activities on the new block until the 288.7 ha block has been planted in trees.

This application seeks to replace the current Discharge Permit and vary the current Water Permit that are due to expire on 23 May 2024, and 20 April 2030 respectively, with changes proposed to reflect system changes.

The applicant is seeking new and replacement resource consents with a common expiry date of 31 December 2030.

In summary, consent is sought for the following:

Replacement consents sought with changes:

- AUTH-20146434-01-V2 - to discharge dairy shed effluent to land from a proposed 1,200 cows and increase the effluent disposal area by approximately 23 ha (less normal buffers e.g., distances from water bodies, property boundaries, etc).

Variations Sought:

- AUTH-20202016 - to take and use groundwater for the proposed dairy operation and stock drinking water for 1,200 cows (slight increase).

New consents sought:

- to use land for dairy farming that did not exist as of May 2016 and to increase cow numbers (Rule 20 pSWLP)
- to convert land on farm to dairy farmland that was not used as dairy farmland prior to 2 September 2020 (Regulation 19 NES-F)
- to discharge contaminants associated to the use of land for dairy farming (Regulation 24 NES-F).

The following assessment has been guided by advice from Bruce Halligan from Environment Southland. A site visit was undertaken with Bruce Halligan and George Gericke on 14th September 2022. The applicant has sought feedback from Te Ao Marama, no formal feedback has yet been received as Te Ao Marama are awaiting receipt of the complete application, but high-level discussions has been had.

The proposal includes the implementation of a wide range of good management practices and mitigation measures which avoid and mitigate adverse effects on the environment. These are described in detail in this proposal and are also included in the landowner's Farm Environmental Management Plan (FEMP).

The report includes nutrient budgets prepared using OverseerFM that shows a 6.8% reduction in nitrogen loss to water and 39.4% reduction in phosphorus loss to water. These local reductions are the result of:

- A reduction in grazed area due to conversion to forestry
- Reduction in fertiliser applied on winter crops.
- Decrease in phosphorus fertiliser use.
- Overall reduction in stocking capacity as measured by RSU[2] across the entire landholding.
- Reduction in RSU per hectare on the original Fawna Farms dairy area
- Increase in effluent disposal area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed.
- Removal of stock access to waterways.

Other proposed mitigations not rewarded through the OverseerFM model include:

- A 10m buffer from all waterways to winter forage crops (grazed 1 May to 30 September), where the buffer will be uncultivated and retained in pasture.
- Planting of 5.5ha area between dairy shed and Gap creek.
- Buffers applied in new forestry block between existing vegetation, and waterways.

1.2 The Applicant

Applicant Address:	370 Mossburn-Lumsden Highway, Castlerock 9792
Address for Service:	C/- Landpro Limited PO Box 302 Cromwell 9342

1.3 Purpose of Documentation

Under Section 88 of the Resource Management Act 1991 (the RMA), this report provides an assessment of the activities effects on the environment as required by Schedule 4 of the RMA.

[2] RSU means revised stock unit and is defined as an animal with an intake of 6,000 MJ ME intake per year. RSU is useful for assessing and comparing a farm's carrying capacity, i.e., how intensive a farm is, or the number of animals that can be grazed in a certain period. This enables the carrying capacity of dairy and non-dairy systems to be compared.

2. DETAILS OF PROPOSAL

2.1 Location

The dairy shed is accessed from Scott Gap Feldwick Road, near Feldwick. The existing dairy farm as well as the new 165.9 ha block to be added are shown in Figure 1. Dark Green shows the area to be retired from pastoral use and planted in forestry, with buffers and no planting areas identified. A 24 ha area of QE2 Covenant will be purchased by Fawna Farms Ltd.

2.2 Details of Consents and Proposal

2.2.1 Land Use Consent for Farming (Proposed Expanded Dairy Activities)

The dairy platform was converted in 2014 from sheep farming and was granted 10-year consents for effluent discharged from 900 cows and to abstract groundwater for a dairy operation and stock drinking water. The existing consents (discharge and water) have been varied over time, with both consents transferred from Feldwick Lindsay Farms Ltd to Fawna Farms Ltd on 1 June 2022.

Table 1 summarises the land to be amalgamated into the existing platform.

Table 1: Overview of land areas.

Farm Details		
Address	1620 Ohai Clifden Highway Dairy shed accessed from Scott Gap Feldwick Road NZTM 20001201663E 4890884N	
	Current	***Proposed***
Legal Description	Lot 3 DP 340527; Pt Section 94 Waiau SD; Section 1 SO 452868 Section 18 Merrivale Settlement No 2; Pt Section 29 Blk IX Waiau SD; Pt Section 94 Waiau SD; Pt Section 94R Waiau SD; Pt Section 29 Blk IX Waiau SD; Section 16 Merrivale Settlement No 2; Section 110 Waiau SD; Pt Section 8 Blk IX Waiau SD	Same as current plus 165.9 ha of below land parcels. *Subdivision consent to be filed with SDC separating new forestry from new dairy.* Lot 2 DP 7360; Lot 7 DP 7360 Lot 6 DP 7360; Lot 1 DP 7360 Lot 3 DP 7360; Lot 5 DP 7360 Lot 4 DP 7360; Section 250 Waiau SD The QE2 land is on land legal described as Lot 5 DP 7360.
Total farm area	370.9 ha (effective – 365 ha)	536.8 ha (effective – 506 ha)
Cow numbers	900	1,200
Cows/ha (effective)	2.5 cows/ha	2.4 cows/ha
RSU	14,671	12,598
Winter Crop	Max 2014 – 2019 NES-F – 58.4 ha • Platform 24.7 ha on flat land • New Block 33.7 ha over flat, rolling, and easy hill topographies	Proposed total 53.7 ha rotating over landholding on flat land

Summary of matters that relate to the land use consent for farming sought under this proposal:

- The use of 512.8 ha of land for dairy farming.
- Milking up to 1,200 dairy cows twice per day.
- Intensive Winter Grazing of 53.7 ha of winter forage crop.
- The consent holder has a Farm Environment Management Plan that is appended to this application (Appendix A).

2.2.1 Intensive Winter Grazing

The applicant proposes to continue intensive winter grazing across the new larger landholding.

Over the 536.8 ha new larger dairy farm, there will be 53.7 ha of annual forage crop grazed for intensive winter grazing purposes, with crops rotating; 20 ha (up to 24.7 ha during 2014-2019 based on aerial imagery) of this is already occurring on the existing dairy farm, and 33.7 ha on the block being subdivided.

On the subdivided block, by retiring 288.7 ha of pastoral land, some of which was previously used for IWG, the applicant is proposing that IWG activities will in future occur on land with a more suitable contour for grazing. Of the 33.7 ha of forage crop on the original dairy support block, IWG was occurring on rolling to easy hill contour land that is now proposed to be retired from grazing as part of the subdivision and planted in planation forest. Fawna Farms are proposing to cultivate and graze this crop on more suitable contour land as part of the 165.9 ha block purchased and amalgamated with their existing dairy farm. See Section 2.2.4 also.

Rule 20(a)(iii)(3) of the PSWLP lists practices that must be implemented to meet the permitted activity Rule 20(a)(iii) where IWG forms part of the farming activity on a landholding.

The proposed 53.7 ha of winter forage crop is <15% (and less than 100ha) of the property area, therefore the area of winter crop complies with Rule 20 of pSWLP.

All matters under Rule 20 (a)(iii)(3) are met:

(A) slope – 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

(B) Stock are back-fenced during break/block fencing;

(C) transportable water troughs are provided in or near the area being grazed or grazing plan and crop placement considered the location of permanent water troughs;

(D) Baleage straw or hay are placed in portable feeders;

(E) Mobs are cattle are no greater than 120 cattle; and

(F) critical source areas (including swales) within the area being grazed that accumulate runoff from adjacent flats and slopes are grazed last.

The National Environmental Standard for Freshwater includes matters related to IWG. Under the NESF resource consents (land use consent and discharge permit) are required after 1 November 2022 under

Subpart 3.

The 53.7 ha of IWG on the applicant's landholding does not exceed the greater of 50 ha or 10% of the farm area, which would be 53.7ha, (Regulation 26(4)(a)). With regards to Regulation 29, the maximum area of crop from the period 1 July 2014 to 30 June 2019 was 58.4ha, and the proposed 53.7 ha is not greater than this.

Regardless of 26(4)(a) and 29, there are other key provision is Regulation 26 which relate to pugging, ground cover, slope, and critical source areas. The applicant is not proposing to graze slopes over 10 degrees, or critical source areas 1 May to 30 September. An assessment in relation to 26A and 26B is provided in Section 3.3.

The applicant is proposing a 10m buffer from all waterways to winter forage crops between 1 May to 30 September, where the buffer will be uncultivated in forage crop and retained in pasture.

2.2.2 Discharge Permit

Effluent collected at the dairy shed is gravity feed to a twin weeping wall with 500 m^3 capacity. The concrete lined weeping wall will be used to separate solids from the farm dairy effluent (FDE) before it enters the large pond. Liquid effluent drains from the weeping wall to a synthetically lined effluent pond with leak detection system. The pond is approximately 47.8m x 47.5m x 3.36m deep, with a 2:1 internal batter and 0.5m freeboard, with a storage capacity of 4,590 m^3. The stone trap is cleaned out regularly, with any solids applied to land as a permitted activity.

A low-rate raingun (10mm depth; 10 mm/hr) is used to apply effluent.

The applicant is proposing to increase the consented area available for effluent discharge by approximately 23 ha to cover the entire 'hydranted' area (less the standard buffer distances). This small additional area has hydrants available, and therefore extending the current authorised area to these paddocks, less buffers, makes good sense (see Figure 4). The applicant proposes to use the same travelling irrigator on this new area.

This new area has been ground-truthed to be less than 7 degrees in slope, using 5m contours derived from topographical survey completed by IFS Growth despite the area being classified Category C under the RWP.

See Appendix D for DESC and Appendix E for visual assessment of weeping walls.

Table 2: Effluent and Discharge activities

Discharge Permit Details	
Permit no.	AUTH-20146434-01-V1
Number of dairy cows	900 - 1,200 proposed
Stocking rate (cows/ha)	2.4 cows/ha
Winter milking	Nil
Wintering barn	Nil
Feed pad/standoff pad	Nil
Type of shed	64 bail rotary
Effluent treatment	Twin weeping wall (Figure 3)
Storage available	4,590 m^3
Storage required (90%) DESC	882 m^3
Disposal area	248.4 ha, plus proposed 23 ha with buffers to be applied (Figure 4)
Irrigator	Travelling irrigator
Application rate and depth	10 mm depth; rate not exceeding 10 mm/hour

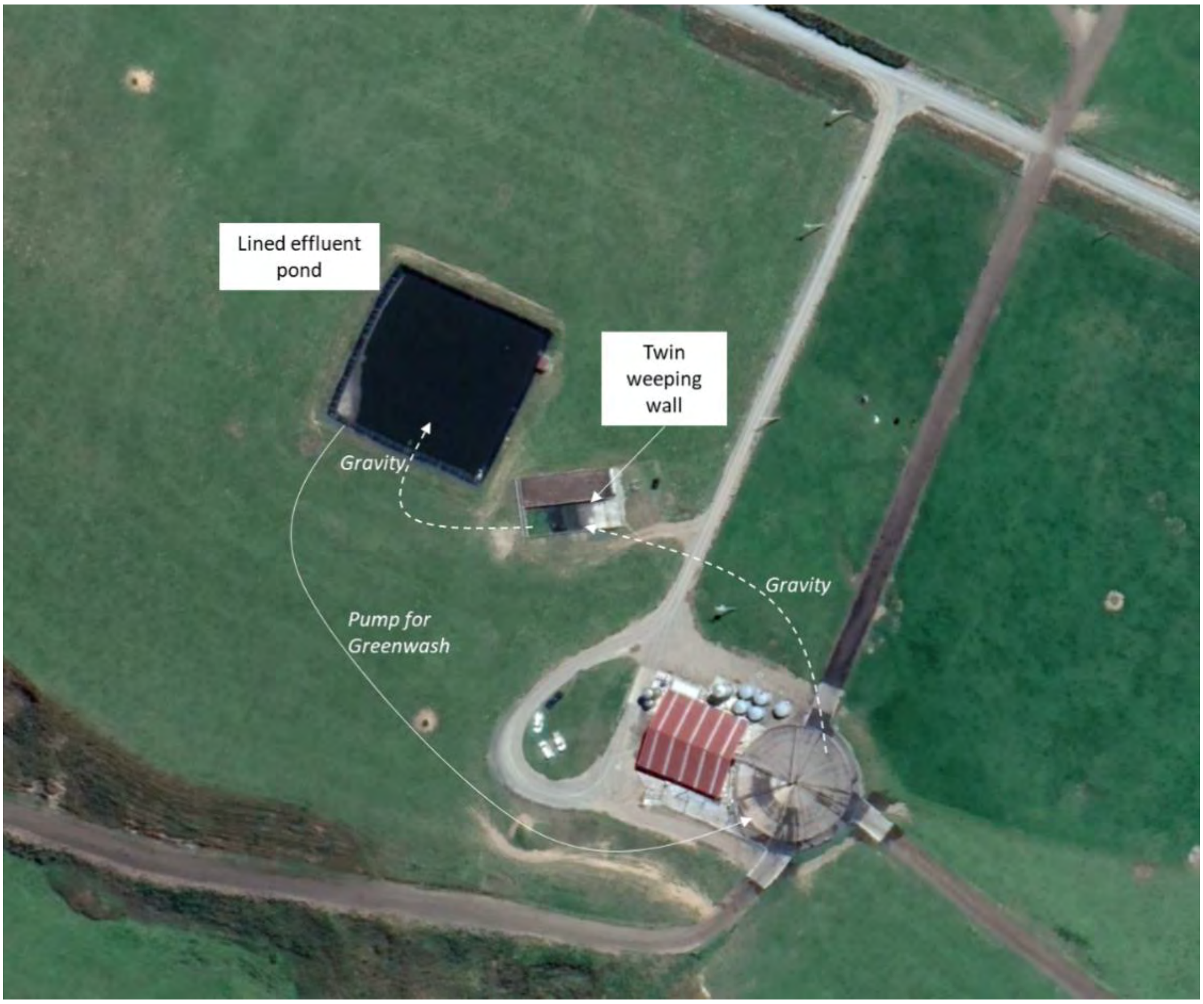


Figure 3: Effluent system overview.

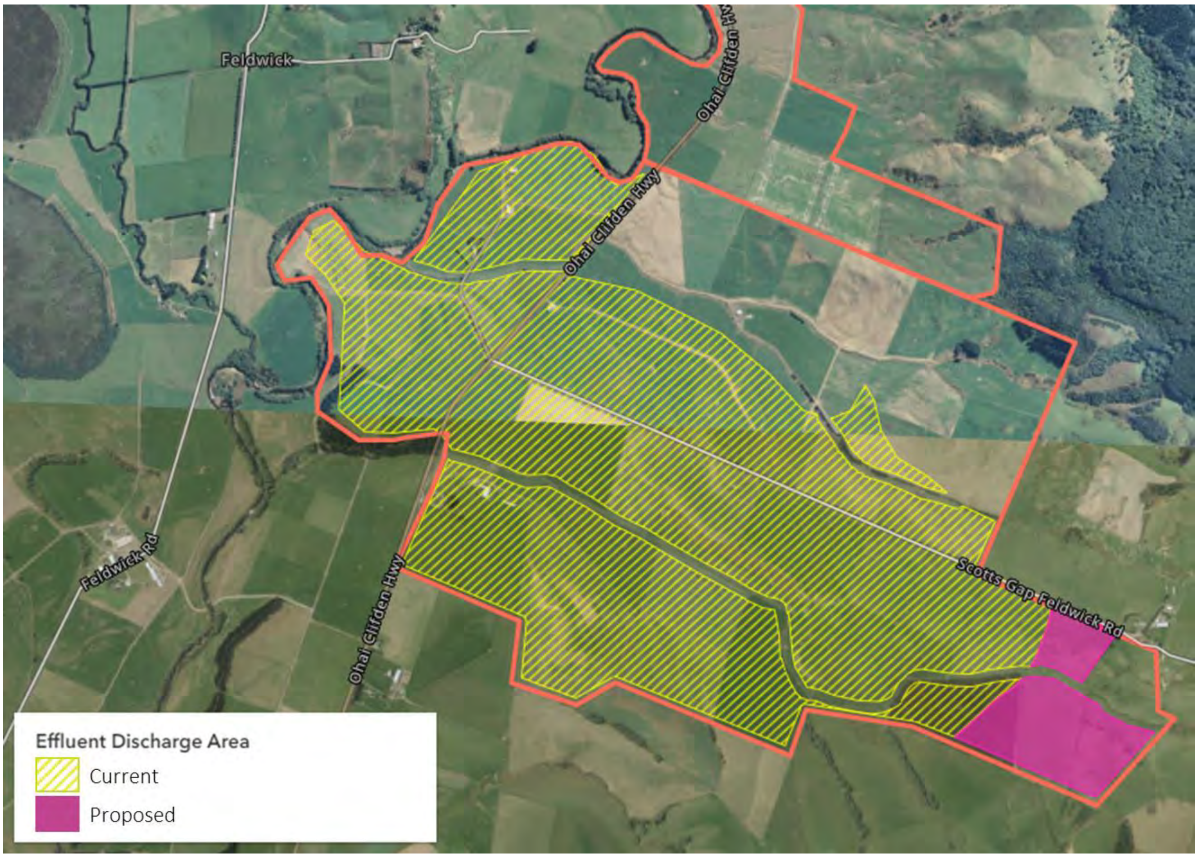


Figure 4: Effluent discharge area, 248.4ha, plus additional approx. 23 ha (pink), note buffers to be applied in this area.

2.2.3 Water Permit for Dairy Operation and Stock Drinking Water

Water is abstracted for the stock drinking needs and washdown needs by way of four bores – note there are five listed on the current consent. The well D45/0348 is on land not owned by Fawna Farms Ltd, and relates to land retained by the previous consent holder. The four bores are located on the applicant's own property, and Table 3 summarises the relevant details of the water abstraction activity. As part of this proposal the applicant is seeking to vary the existing water permit and increase their daily water allowance to 140 L/cow/day, whilst the seasonal use will be based on 120 L/cow/day.

A replacement water permit was sought by the previous consent holder in 2020, and a 10-year consent term was granted. For this reason, we are not applying to extend the expiration date of this consent, and are seeking variation only to accommodate the additional drinking water and dairy shed wash water requirements, and remove D45/0348.

Table 3: Water take for dairy operation activities.

Water Permit Details		
Permit no.	AUTH-20202016	
Groundwater Zone	Unclassified	
Bore	D45/0316 1201548E 4890938N D45/0355 1200616E 4891852N D45/0349 1200769E 4891929N D45/0351 1200311E 4891492N	
	Current - 900 cows	**Proposed – 1,200 cows**
Rate of take	2 l/s	2 l/s
Daily volume	140,000 L/day	179,625 L/day Peak demand for dairy head, bulls, and youngstock. 140 L/cow/day – daily for dairy herd
Annual volume	51,100 m^3/year	52,560 m^3/year 120 L/cow/day x 365days Annual demand for 1,200 cow milking heard, bulls, wintered dairy cows, youngstock and calves. And cowshed.

2.2.4 Plantation Forestry

IFS Growth Ltd is working closely with Fawna Farms Ltd. IFS Growth is responsible for the development of the 288.7 ha forestry block and any associated consents which includes the subdivision work that is in progress.

The applicant, and IFS are proposing to retire 288.7 ha of pastoral land and plant this in plantation forestry, see Figure 1, see also proposed planting plan in Appendix B and recreated below as Figure 5. The applicant and IFS Growth propose as a water quality mitigation to nutrient offset from this plantation forestry. To link this mitigation to the expanded dairy farm and provide assurances on the permanence of the forestry block the landowners have proposed that the planting of the 288.7 ha block in forestry is completed before expanded dairy activities can commence.

Water bodies within and adjacent to the proposed planting boundaries will have riparian zone buffers (Figure 5) applied. The areas adjacent to water bodies will remain uninterrupted to allow revegetation from the existing grazed pasture area. It is expected that rank grass will grow first and then blackberry/gorse and some native revegetation is likely. These vegetated buffers will positively impact the health and well-being of these water bodies through long term protection and a focus on minimal disturbance.

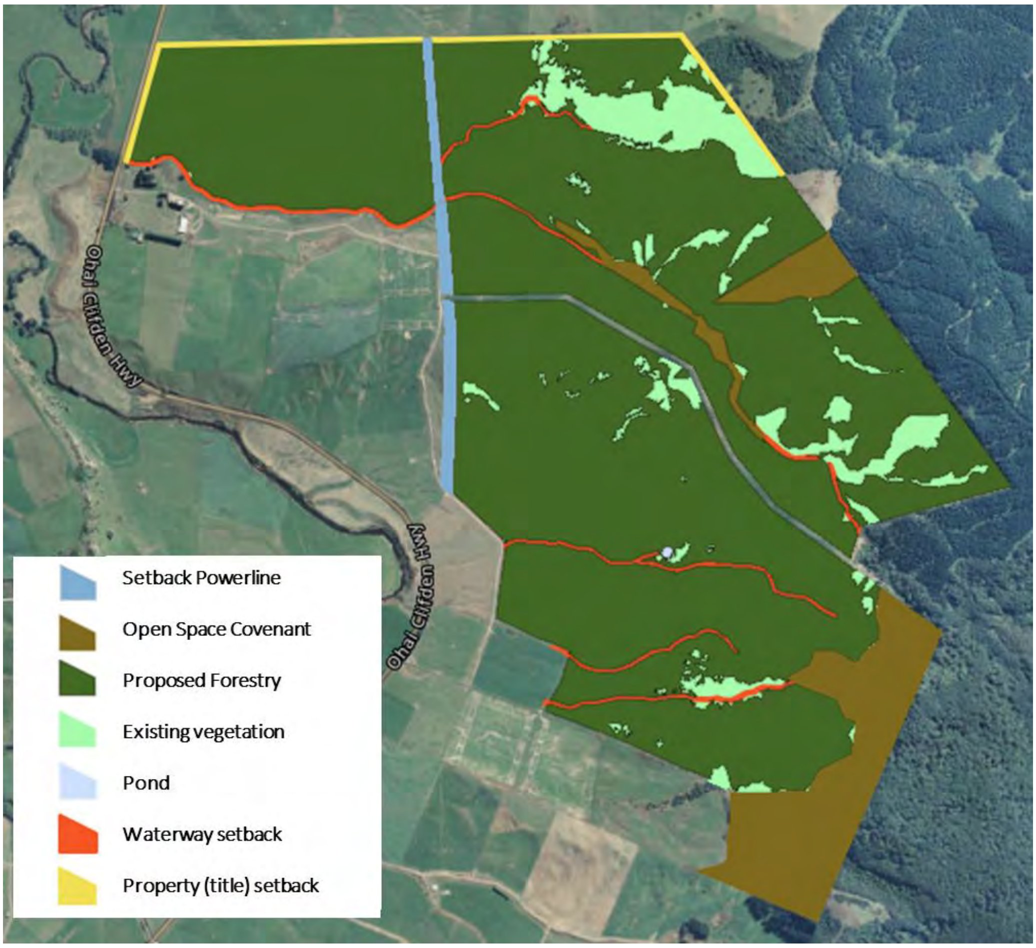


Figure 5: Proposed forestry plan showing where setbacks will be provided and where natural forest (existing vegetation that is not pasture) will remain.

2.3 Proposed Conditions

We have not sought to replicate Environment Southland's standard conditions for the land use consent to use land for farming, nor have we captured all exclusions and/or mitigations that will apply, rather the below are proposed conditions in relation to the commencement of expanded dairy activities and the forestry block development.

1. The use of land for farming shall occur on the landholding at address, as shown on the plan attached as Appendix 1, and consisting of:
    a. An existing block of land at or about map reference (NZTM 2000) 1201663E 4890884N and comprising Lot 3 DP 340527; Pt Section 94 Waiau SD; Section 1 SO 452868; Section 18 Merrivale Settlement No 2; Pt Section 29 Blk IX Waiau SD; Pt Section 94 Waiau SD; Pt Section 94R Waiau SD; Pt Section 29 Blk IX Waiau SD; Section 16 Merrivale Settlement No 2; Section 110 Waiau SD; Pt Section 8 Blk IX Waiau SD; and
    b. A new block of land at or about map reference (NZTM 2000) 1200884 4893306 and comprising Lot 2 DP 7360; Lot 7 DP 7360; Lot 6 DP 7360; Lot 1 DP 7360; Lot 3 DP 7360; Lot 5 DP 7360; Lot 4 DP 7360; Section 250 Waiau SD.

2. The consent holder shall not commence expanded dairy activities on the block referred to in Condition 1(b) until:
    a. a 288.7 hectare block marked as 'new plantation forest' as shown on the plan attached as Appendix 1 has been fully retired from pastoral grazing; and
    b. date stamped photos have been submitted to the Consent Authority (EScompliance@es.govt.nz) showing that the 288.7 hectare 'new plantation forest' referred to in (a) above has been fully planted in trees; and
    c. confirmation has been received in writing from the Consent Authority that Condition 2(b) has been complied with. However, if this confirmation is not received within 10 working days of submission this will be taken as confirmation by the Consent Authority as compliance with Condition 2(b).

We have chosen not to specify a date as this is at the discretion of the two land owners, and Fawna Farms Ltd is aware, and agrees to the above.

The above provides certainty that the forestry and commitment to offsetting will occur prior to expanded dairying activities, whilst the National Environmental Standard for Freshwater and Emissions Trading Scheme obligations provide the relevant regulatory backstops to the 288.7 ha block being used for anything else other than forestry.

2.4 Compliance

Discharge Permit - AUTH-20146434-01-V1

The previous consent holder had been fully compliant and has good record from inspections.

Water Permit - AUTH-20146434-02 (now superseded by AUTH-20202016)

The previous consent holder had issues with the supply of water use data on time and some over-abstraction that was rectified through a new water permit granted in 2020. The record for AUTH-20202016 show full compliance.

Effluent Pond Construction - AUTH-20146434-03

The effluent pond was signed off with pond construction report provided by David Rider of RD Agritech Ltd in September 2014.

Water Permit - AUTH-20202016

The previous consent holder had been fully compliant.

3. ACTIVITY CLASSIFICATION

3.1 Consents Required

The following resource Consents are required under the Regional Water Plan for Southland, 2010 (RWPS) and Proposed Southland Water and Land Plan, 2018 (PSWLP).

Table 4: Consents required and applicable rules.

Consent	Plan	Rule	Activity Status
Discharge Permit – to discharge agricultural effluent to land	RWPS	50(d)	Restricted Discretionary
	PSWLP	35(b)	Restricted Discretionary
Water Permit – to take and use groundwater for dairy operation	RWPS	23(d ii)	Discretionary
	PSWLP	54(f)	Discretionary
Land Use Consent and associated Discharge Permit – to use land for expanded dairy farming and intensive winter grazing	RWPS	17A	Not applicable
	PSWLP	20(e)	Restricted Discretionary
	NES-F	Regulation 19, 24, 27	Discretionary
RWPS – Regional Water Plan PSWLP – Proposed Stoutland Water and Land Plan NES-F – National Environmental Standard for Freshwater			

Effluent Discharge - The applicant is proposing to discharge agricultural effluent via low-rate methods to already authorised Category A, B and D soils (relevant under RWP only). The proposed additional 23 ha of new FDE area are on land categorised D and C based on ES Beacon classifications. Despite this, the slope in this area has been ground-truthed as less than 7 degrees by way of 5m contours generated from land survey (undertaken by IFS Growth and provided to Landpro on 3 August 2022 – See Figure 9), and therefore not

Category C. Therefore, the discharge is the replacement of an existing discharge consent and is covered under sections 124-124C of the RMA, and a new area of land to be added is <7 degrees in slope, using low-rate irrigation, and the existing resource consent specifies the maximum number of cows.

Groundwater for stock drinking water and dairy operation - The applicant is proposing to abstract groundwater from outside a classified groundwater zone which is within primary allocation limits with a low rate of take, 2 l/s. The total volume of groundwater abstraction is within the primary allocation limit established following the methodology outlined in Appendix L.7 of the pSWLP. See section 6.3.1.

Expanded dairy – the applicant is proposing to include an additional 165.9 ha within the existing dairy platform (noting 24 ha of this is QE2 covenant and is within the legal parcels that comprise 165.9 ha), and increase cow number by 300, to a total of 1,200 milking cows. The land area of the dairy platform and the number of cows will therefore be greater than at 3 June 2016, requiring resource consent under Rule 20.

The inclusion of 165.9 ha into the milking platform does not meet the permitted activity conditions under Regulation 18 of the NES-F, and the total area of dairy farmland will be greater than it was at the close of 2 September 2020 by more than 10 ha.

Discharge permit– a discharge permit is required for the discharge of contaminants to land associated with the use of land for dairy farming that was not used as dairy farmland prior to 2 September 2020.

Bundling - Overall, the proposal is 'bundled' to be treated as a **discretionary activity**.

3.2 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: Activities for which Consent is Not Required.

Activity	Plan and Rule	Compliance with the relevant permitted rules of the RWPS and PSWLP
Use of land for the maintenance and use of an existing agricultural effluent storage facility	RWPS	The use of land for the maintenance and use of the existing agricultural storage facility (includes tanks, weeping walls, sumps, and stone traps etc) that was authorised before 4 April 2018 is a permitted activity providing the construction of the facility was authorised by a resource consent. Consent number: AUTH-20146434-03
Incidental discharges from farming	PSWLP Rule 24	The land use associated with this discharge will be authorised under PSWLP Rule 20.
Fertiliser	RWPS Rule 10 PSWLP Rule 14	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 riparian margins with stock excluded.
Silage storage and	RWPS Rule 51	All silage storage facilities are located away from sensitive receiving

Activity	Plan and Rule	Compliance with the relevant permitted rules of the RWPS and PSWLP
silage leachate	PSWLP Rules 40 & 41	environments, in accordance with permitted rule setbacks and no direct discharge of silage leachate to any waterbody is proposed.
Sludge	PSWLP Rule 38	Solid sludge effluent collected from the sumps and effluent pond will be laid out to dry before applying to land when conditions are suitable, observing appropriate separation distances, and there will be no disposal of solids to any waterway.
Cleanfill, Farm Landfills and Offal Holes	RWPS Rules 53, 54 & 55 PSWLP Rules 42 & 43	No more than 500 m^3 of material will be discharged within cleanfill sites. Stormwater will be directed away from fill areas and no unauthorised material will be placed into proposed fill areas. No naturally formed limestone rock is known to reside within the property. Excavation of fill holes do not intercept springs and are not below the seasonal mean groundwater level in that location. Sensitive areas can be easily avoided when undertaking these associated activities.
Drainage of Land (Rule 9 RWPS & Rule 13 pSWLP)	RWPS Rule 9 PSWLP Rule 13	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 20 metres from the point of discharge. The proposed good management practices will significantly reduce the likelihood of any contaminants reaching the subsurface drains.

3.3 National Environmental Standards for Freshwater

The Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (referred to here as the NESF). The NESF regulates activities that pose risks to the health of freshwater and freshwater ecosystems.

Assessment of consent required under the NES-F is provided above. The below covers activities for which no consents are needed, with reasoning provided as follows:

- There is no irrigation of dairy farm land;
- There are no feed lots or stock holding areas;
- Application of synthetic nitrogen complies with the 190 kg/ha/year cap.
- Intensive winter grazing, see section 2.2.1.

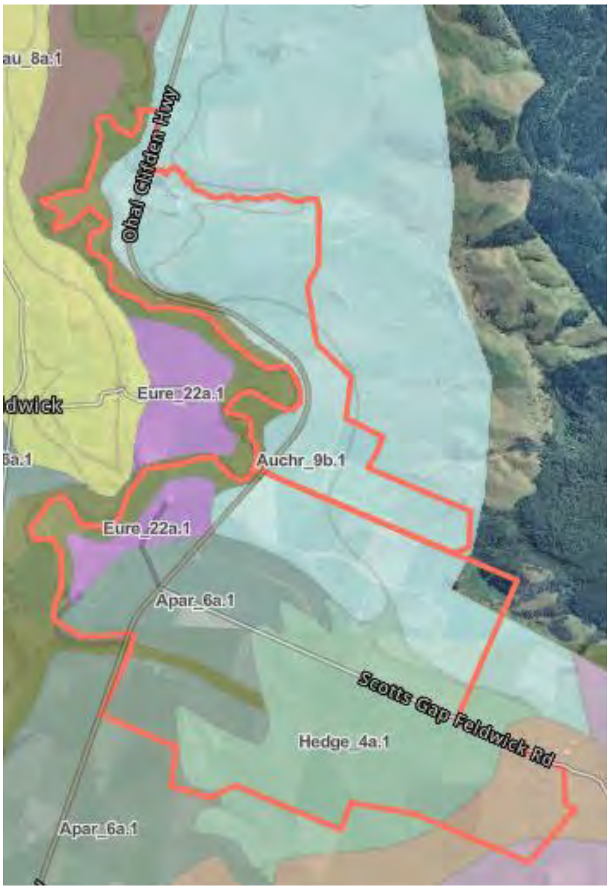
Regulation 26A and 26B of the NES-F were introduced on 1 May 2022. The applicant proposes to ensure that adverse effects on waterways from pugging is minimised, and groundcover will be re-established were as soon as practicable after livestock have finished grazing. This is further addressed in the GMPs included within the applicant's Farm Environmental Management Plan.

4. DESCRIPTION OF EXISTING ENVIRONMENT

4.1 Farm Environment Summary

Land Use, Topography and Climate			
Surrounding Land Use	Other dairy farms, other winter grazing, forestry, agriculture, rural dwellings.		
Topography and Slope	80 - 145 m above mean sea level; Flat to Rolling		
Physiographic Zones and Soils			
	Soil vulnerability factors		
Soils – 2 primary types	**Structural Compaction**	**Leaching**	**Waterlogging**
Auchreddie	Moderate	Medium	High
Hedgehope	Moderate	Low	High
FDE land classification	A – Artificial drainage or coarse soil structure B – Impeded drainage D – Well drained flat land		
Physiographic Zones	Bedrock/Hill Country (o) Gleyed (o) Oxidising (a) and (o)		
Contaminant Pathways	Overland flow and artificial drainage, some deep drainage.		
Hydrology and Water Quality			
FDE risk - groundwater	Unclassified		
FDE risk - surface water	Low to high adjacent to Orauea River		
Freshwater Management Unit	Waiau		
Surface Waterways on farm	Unnamed tributaries the Waiau		
Water Quality pSWLP	Lowland hard and soft bed		
Groundwater Management Zone	Unclassified		
Groundwater Estimated TON	Unclassified		
Downstream receiving environment	Te Waewae Bay		
Swimmability	There are no toxic algae alerts in the Waiau catchments. There is a popular bathing site downstream of the property in the wider catchment on the Waiau River at Tuatapere Bridge as per Appendix G of the PSWLP.		
Drinking water supplies	The closest drinking water supply is at Orauea and is a surface water take for the Southland District Council.		
Instream values	A search of the New Zealand Freshwater Fish Database (NZFFD) revealed that Grass Burn creek located on the existing Fawna Farms dairy block has been surveyed in 2018, and no species were recorded. There are no recorded observations in Orauea River near the property. On nearby tributaries, long fin eel has been observed. The nearest downstream water quality monitoring site is the Orauea River at Orawia Pukemaori Road. The Macroinvertebrate Community Index (MCI) is the 93 according to LAWA for 2016-2020 5-year period. The score of 93 is above the national bottom line MCI score of 90, although band C which suggests the macroinvertebrate community is indicative of moderate organic pollution or nutrient enrichment. There is a mix of taxa sensitive and insensitive to organic pollution/nutrient enrichment.		

4.2 Soils and Physiographic Zone



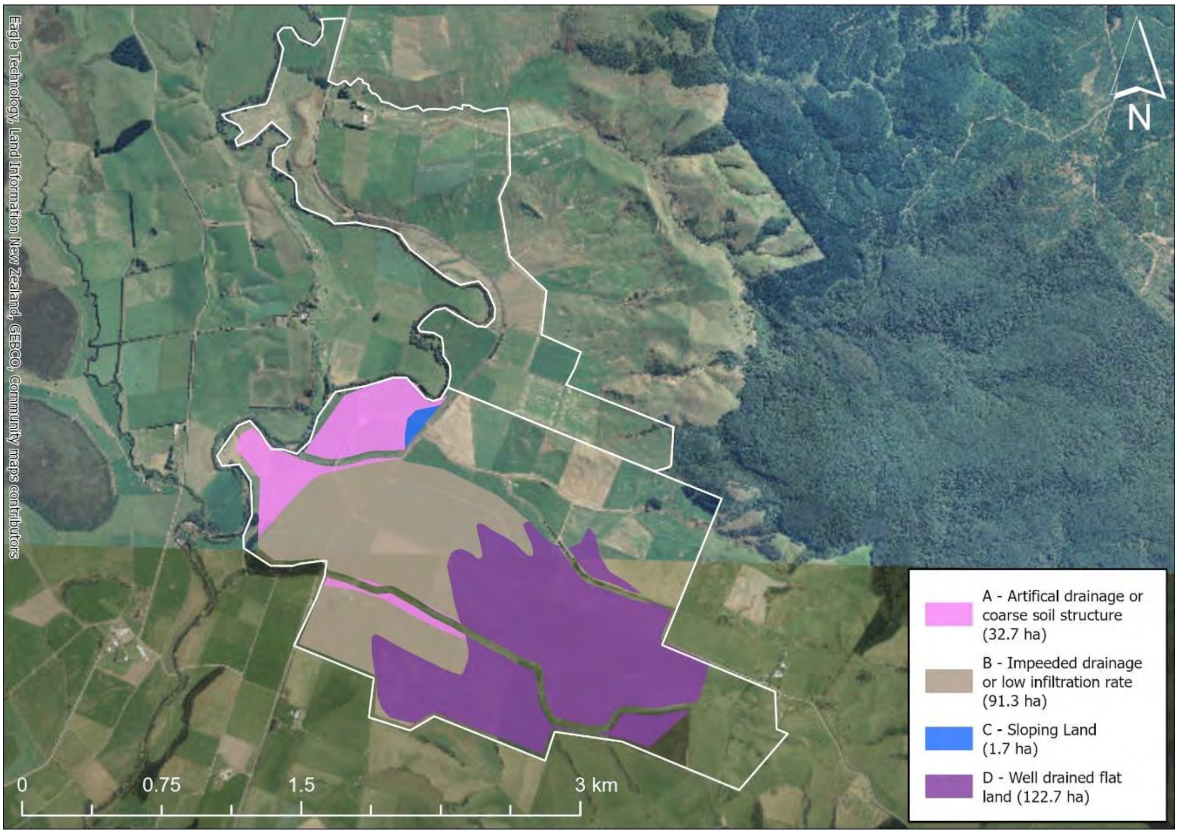


Figure 6: S-map Soils. (Source Data: S-map).

Figure 7: Environment Southland Physiographic Zone (Source Data: Beacon).

4.3 Water Quality Receiving Environment

4.3.1 Groundwater

The general state and trend of groundwater quality within 5 km of the applicant's farm is summarised in Table 6. There are 6 bores located within a 5 km radius of one of the applicant's bores (E44/0349 that have water quality data. Of the 6 bores where data exists, none are for the applicant's bores.

Within a 5 km radius bore uses vary from dairy operation and stock supply, and groundwater quality monitoring.

Table 6: Summary of water quality data for bores within a 5 km radius of the applicant's abstraction bore.

	Date range of data collection	Nitrogen - Nitrate (mg L^{-1})	TON (mg L^{-1}) nitrite nitrogen+ nitrate nitrogen	Total Ammoniacal-N (mg L^{-1})	Dissolved Reactive Phosphorus (mg L^{-1})
All bores within 5 km of E44/0349 (median of all data from all bores)	2006 – 2022	0.002 n=8	0.005 n=11	0.21 n=11	0.183 n=7
Bore D45/0269	13 May 2011	NA	0.09	0.14	NA
Groundwater monitoring bore D45/0364	2018 – 2022	0.002 n=6	0.002 n=6	0.22 n=6	0.183 n=6

The results of groundwater monitoring of the bores included within Table 6 suggests that TON (nitrite-nitrogen + nitrate-nitrogen) are well below the drinking water limit of 11.4 mg/L for nitrate-nitrogen.

The groundwater monitoring bore referred to in Table 6, is located west of the property, and west of the Orauea River. There is no classified groundwater management zone. It is presumed that piezometric groundwater flow is in the direction of the underlying topography and towards the Orauea River.

Of the other 5 bores for which water quality data is available, D45/0269 is located on the same side of the Orauea River as the property, and is downgradient of the existing dairy farm. The water quality observations for this bore are similar to the 5km wide median values, Table 6. See Figure 8 below.

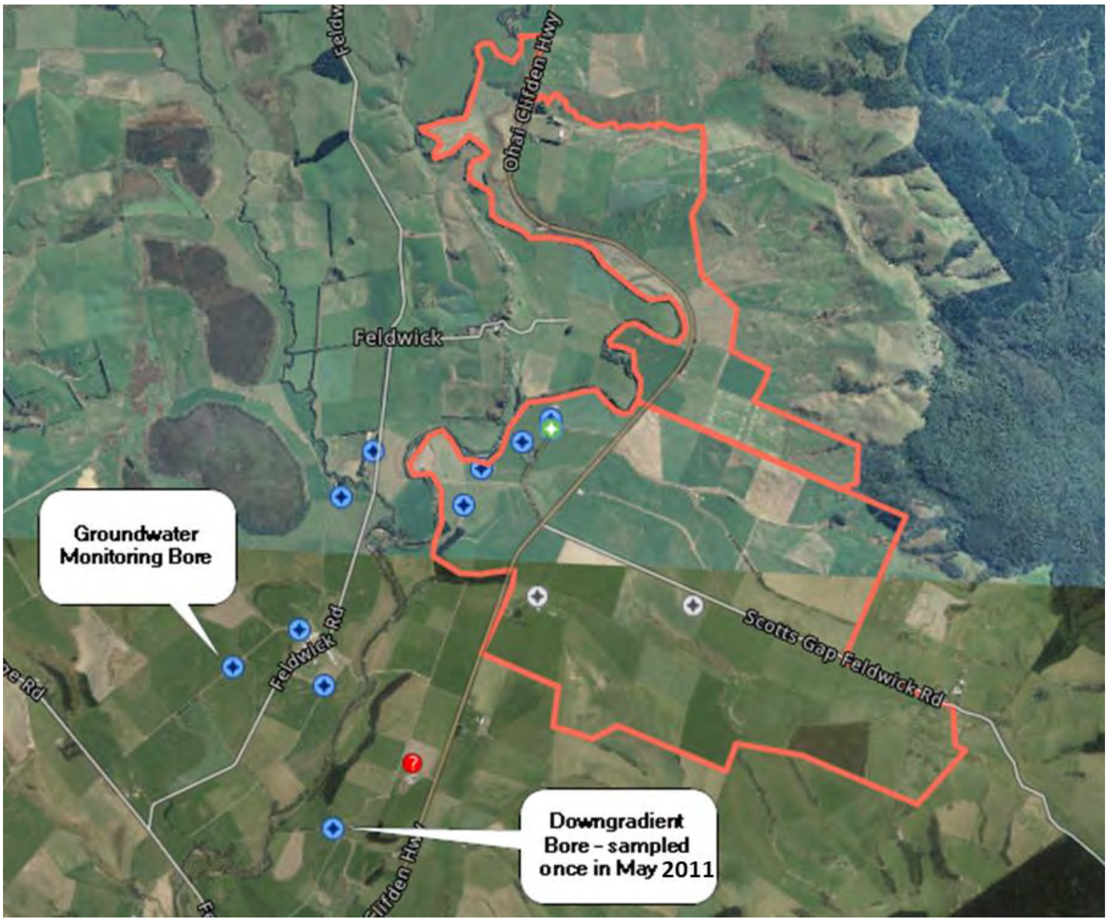


Figure 8: Location of bores referred to in Table 6 - Summary of water quality data for bores within a 5 km radius of the applicant's abstraction bore.

4.3.2 Surface water

There are a number of surface waterways running through the property. The Orauea River runs through the north western corner. Grass Burn and three of its tributaries run east to west long the northern half of the property. Gap Creek and two of its tributaries run east to west along the southern half of the property.

The nearest State of the Environment (SOE) monitoring site to the property is Orauea River at Orawia

Pukemaori Road. Water quality data for this site in summarised in Table 7.

Table 7: Summary of Surface water quality data for state and trend of Orauea River at Orawia Pukemaori Road, LAWA SOE monitoring site, data for 5 year period 2016 – 2021.

LAWA WQ Indicators	State	NOF Band	5-year Median	LAWA 10-year Trend
E. coli	In the worst 50% of all sites	E – For more than 30% of the time, the estimated risk is >=50 in 1000 (>5% risk). The predicted average infection risk is >7%	240 (n/100ml)	Indeterminate
Clarity	In the worst 50% of all sites	A – Minimal impact of suspended sediment on instream biota.	1.24 (m)	Indeterminate
Nitrate-nitrogen	In the worst 50% of all sites	B – Some growth effect on up to 5% of species.	0.55 (g/m^3)	Not assessed
Ammoniacal N	In the best 25% of all sites	B – 95% species protection level: Starts impacting occasionally on the 5% most sensitive species.	0.005 (g/m^3)	Not assessed
Dissolved Reactive P (DRP)	In the best 50% of all sites	B - Ecological communities are slightly impacted by minor DRP elevation above natural reference conditions.	0.009 (g/m^3)	Likely improving

4.4 Te Waewae Bay

Te Waewae Bay is a shallow bay and the largest embayment on the Southland coast. The shoreline of the bay is very variable, the shore type ranging from fine grained sand to gravel, cobbles, and boulders. The foreshore is very mobile and much of the coast is subject to erosion. The Waiau River flows into the centre of the bay. Section 3.4 of the Regional Coastal Plan (2013) describes the Te Waewae Bay as having significant value. As a summary, the key values relevant to this application are:

1) Areas of significant values included the western end of the Te Waewae Bay back onto unprotected land, including Maori land.
2) Hector's dolphins are regularly seen in the western inshore area of the bay. Te Waewae Bay is also part of the migratory path of the Southern Right whale.
3) Toheroa beds; surf clams are found beyond the surf zone. Coastal wetlands, estuaries and lagoons are very important for wildlife habitat, including four species of native fish and two rare or localised species of cultural importance to tangata whenua (the long finned eel and lamprey).
4) One of the principal values of Te Waewae Bay is the degree of accessibility. The location of access points is such that access is available, yet significant lengths of the beach retain an aspect of remoteness or wilderness.

The principles issues are:

- The effect of hydro-electric power development on the Te Waewae Lagoon and Te Waewae

Bay; and

- Future competing values, for example, commercial versus recreational and amenity values.

4.5 Cultural Values

Te Waewae Bay is steeped in Maori history. A settlement was once located at the Waiau mouth but most archaeological sites are concentrated further east in the Orepuki/Pahia Point area.

Ngai Tahu has a strong association with the Waiau River and Schedule 69 of the Ngāi Tahu Claims Settlement Act 1998 details the Statutory Acknowledgement Area for the Waiau River. The Waiau River features in the earliest of traditional accounts, and was a place and resource well known to the earliest tūpuna (ancestors) to visit the area. The tūpuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of the Waiau, the relationship of people with the river and their dependence on it, and tikanga for the proper and sustainable utilisation of resources. All of these values remain important to Ngāi Tahu today.

Place names provide many indicators of the values associated with different areas, including Waiharakeke (flax), Papatōtara (tōtara logs or bark), Kirirua (a type of eel found in the lagoon), Te Rua o te Kaiamio (a rock shelter that was a "designated meeting place" for the local Māori, similar to a marae) and Kā Kerehu o Tamatea – ("charcoal from the fire of Tamatea" – black rocks near old Tuatapere ferry site).

The Waiau River was a major travelling route connecting Murihiku and Te Ara a Kiwa (Foveaux Strait) to Te Tai Poutini (the West Coast) and, as such, was an important link between hapū and iwi. Pounamu on the West Coast, and summer expeditions to Manapōuri (Motu-ua or Moturau) for mahinga kai were the main motivations for movement up and down the Waiau. Mōkihi (vessels made from raupō) were utilised for travel down the river and were a very effective and common mode of travel, making transportation of substantial loads of resources possible.

Te Tangi a Tauira is the Natural Resource and Environmental Iwi Management Plan developed by Ngāi Tahu ki Murihiku for the Southland region and discussed further in later sections of this report.

5. NON-NOTIFICATION & CONSULTATION

A consent authority has the discretion whether to publicly notify an application unless a rule or National Environmental Standard (NES) precludes public notification (in which case the consent authority must not publicly notify) or section 95A(2) applies.

The AEE included within this report demonstrates that the effects of the activities will be no more than minor.

There are no rules or NES' which require the public notification of the application. In addition, there are no special circumstances relating to the application.

Clause 6(1)(f) of Schedule 4 of the RMA requires the identification of, and any consultation undertaken with, persons affected by the activity. We consider that the evidence on adverse effects would justify non-notification or limited notification to Te Ao Marama and Ngāi Tahu. However, the applicant appreciates there is public interest in applications of this nature and understands that Environment Southland has indicated that such applications (additional dairy platform land and additional cows) should be publicly notified. **Therefore, to enhance the efficiency of the process, as the proposal is for expanded dairy activities, including additional land and cows, the applicant requests public notification.**

Prior to submitting the application, the applicant has discussed the application with Te Ao Marama and is in the processes of endeavouring to obtain feedback on any concerns that might exist for the current proposal.

6. ASSESSMENT OF ENVIRONMENTAL EFFECTS

In addition to the application being made in the prescribed forms and manner, Section 88 of the RMA also requires that every application for consent includes an assessment of the effects of the activity on the environment as set out in Schedule 4 of the RMA.

For ease of assessment, common assessment matters across activities for which consent is sought, and those related to water quality are discussed under Section 6.4 – Assessment of Effects that relates to the dairy expansion. The purpose of doing this has been to avoid duplication across multiple sections.

6.1 Assessment of Alternatives

Schedule 4 of the RMA requires that an assessment of environmental effects must include a description of any possible alternative locations or methods for undertaking the activity if it is likely that the activity will result in any significant adverse effect on the environment and/or if the activity includes the discharge of contaminants. None of the activities described in this report would result in significant adverse effects on the environment and so this assessment of alternatives considers the proposed discharge of FDE only.

Method of Discharge

Deferred irrigation methods will be utilised on the property to ensure that effluent is only applied when conditions are suitable. The applicant has intentionally sized the treatment and storage system larger than required to ensure enough deferred irrigation. This decision was made at time of conversion in 2014. There are no other practicable environmentally acceptable alternatives to applying FDE to land.

Receiving Environment

Discharging effluent to land, if conducted appropriately, enables the reuse of a waste product as a soil conditioner and provides nutrients for plant growth. Attenuation of contaminants cannot occur if effluent is discharged directly to water and is therefore considered unsuitable. Direct discharge to water would almost certainly be more detrimental to the receiving environment than discharging to land.

Overall, the proposed discharge methods and receiving environment are the most suitable for managing the

FDE generated at the farm.

6.2 Discharge of Agricultural Effluent

6.2.1 Effluent Application Area, Rate and Timing

The applicant intends to use the existing land disposal system (low-rate pods and a travelling irrigator) and proposes to use a slurry tanker and umbilical system as contingency measures (Table 8).

Table 8: Proposed disposal depths.

Type of effluent disposal system	Proposed Rate and Depth of Application
Primary System:	
Low-rate pods and travelling irrigation	10mm depth; 10 mm/hr
Contingency:	
Umbilical & slurry tanker	10mm depth

The DairyNZ "Pocket guide to determine soil risk for farm dairy effluent application" indicates that for FDE classification A – Artificial drainage or coarse soil structure; B – Impeded drainage; and D – Well drained flat land, applications of this nature (Table 8) are appropriate and meet the requirements of the existing discharge permit.

The applicant's Farm Environmental Management Plan details the GMPs used to manage effluent storage and application.

The depth of application and assimilation in the topsoil will ensure that an appropriate separation distance to subsurface drains is maintained.

6.2.2 Storage

Effluent storage at the farm consists of a synthetically lined pond with pumpable volume of 4,590 m^3. The existing effluent storage facilities will remain in use on farm to allow for continued deferred storage of FDE generated.

This pond has a leak detection system and was constructed with resource consent (AUTH-20146434-03), and so no pond drop test has been undertaken.

The Dairy Effluent Storage Calculation (DESC) calculation included in Appendix D shows the 90%ile volume liquid effluent storage required to enable effective deferred irrigation of effluent generated from up to 1,200 cows is 881.5 m^3, or a maximum of 1,046 m^3.

The existing pumpable storage volume is therefore more than adequate and provide 4-5 times storage than is required. Despite this, good management is essential for liquid effluent of this quantity.

Visual assessment of the associated weeping wall and sludge beds are contained within Appendix E.

6.2.3 Nutrient Loading

Effluent calculations for the current system have been carried out using DESC and indicates that the proposed farm system will produce around 21,900 m^3 of FDE per year. This equates to 80.7 m^3/ha/yr based on an irrigation area of 271.4 ha (248.4 ha current + proposed 23 ha). Using DairyNZ (2010) guideline N concentration of FDE of 0.45 kg/m^3, this equates to an areal loading of 36.3 kg N/ha/yr and equates to 24% of Environment Southland's (ES) recommended maximum areal rate of 150 kg N/ha/yr for all N inputs and is significantly less than the limit imposed by current consent conditions.

ES's recommended maximum areal rate of 150 kg N/ha/yr is supported by the 2009 report for Environment Southland by AgResearch[3] that recommended the maximum N load as a management criterion to avoid direct losses of land-applied FDE. Given that the proposed areal loading is a fraction of the limit recommended by AgResearch, land-applied FDE nitrogen leaching will be within acceptable limits.

FDE can be used as an organic fertiliser and nutrients are released more slowly than they are from inorganic fertilisers and this slow-release method reduces the risk of nutrient leaching. Overall, the effluent disposal system of the proposed system, as described above allows the effluent to be used as both a fertiliser and soil conditioner with a lower risk of nutrient leaching than inorganic fertilisers.

6.2.4 Disposal Area

A total proposed disposal area of 271.4 ha provides a disposal area to stock ratio of 22.6 ha/100 cows, which is significantly greater than the recommendation of 4 ha/100 cows. The available disposal area is also greater than the minimum required in ES's Best Practice Guidelines, which is 8 ha/100 cows. This limit is derived as a further method for ensuring that ES's recommended 150 kg N/ha/yr areal loading limit for N (discussed above) is not exceeded.

Effluent will not be applied within the following buffer zones:

- 20 m of any surface watercourse
- 100 m of any authorised water abstraction point
- 20 m to any landholding boundary; and
- 200 m of any residential dwelling on a neighbouring property

There are no other sensitive receptors that require separation measures to be implemented. Provided that these buffers zones are maintained, there should be no significant adverse effects resulting from effluent disposal.

The new proposed 23 ha (pink in Figure 9), less any buffers to be applied, has been ground-truthed as <7

[3] Houlbrooke, D J, Monaghan R M, *The influence of soil drainage characteristics on contaminant leakage risk associated with the land application of farm dairy effluent*, 2009, AgResearch Ltd

degrees in slope, as shown in Figure 9. IFS Growth undertook survey of the site which produced 5m contours for the IFS Growth block and Fawna Farms Ltd to facilitate the subdivision and preparation of forestry planting plan. These contours have been used to establish the local slope conditions.

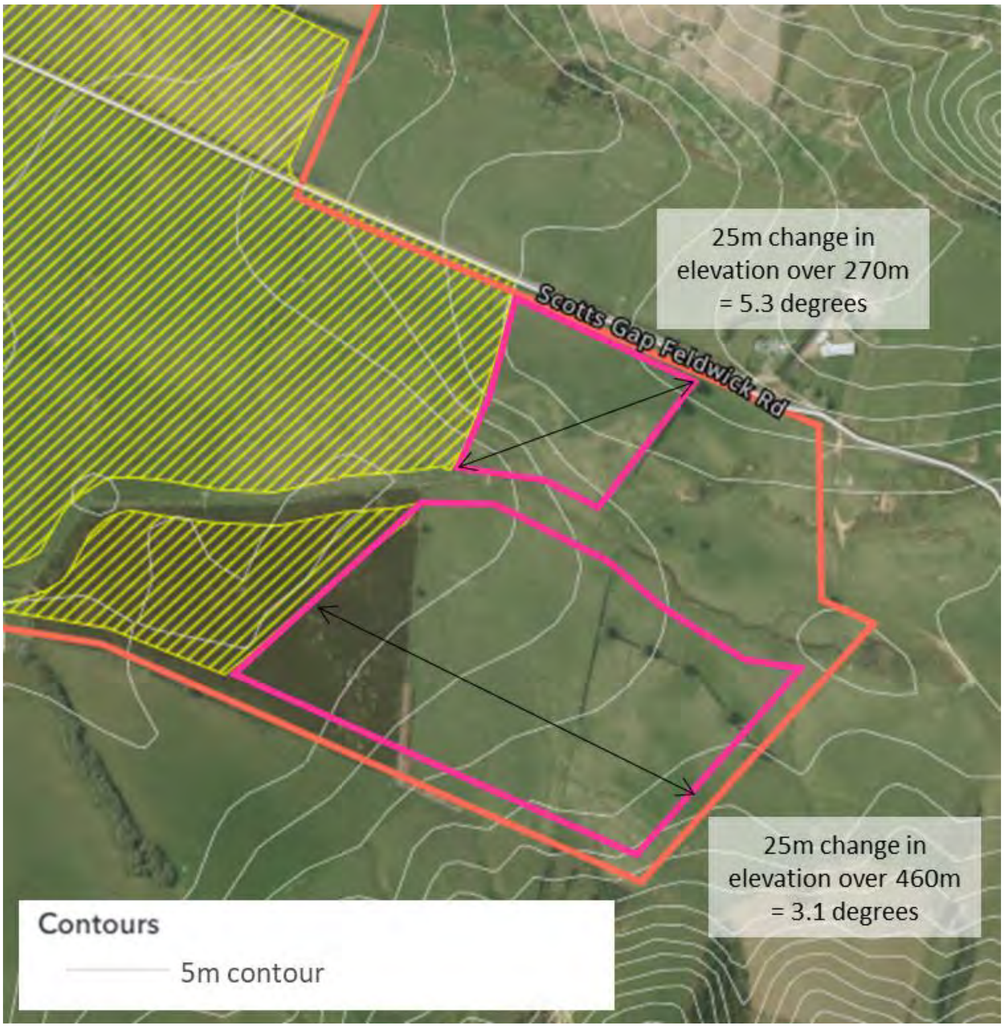


Figure 9: Slope derived from 5m contours for proposed new effluent disposal.

6.2.5 Effects on Groundwater Quality from FDE Disposal

As the applicant will adhere to the buffer zones, the disposal of effluent would very likely result in a reduction of adverse effects on groundwater quality in the vicinity of the property. The buffer zones ensure that any overland movement of contaminants is minimised.

The estimated TON in groundwater suggests deep drainage is unlikely the dominant contaminant pathway of concern on the property, this is consistent with the most probable pathway being overland flow or artificial drainage consistent with the Gleyed physiographic zone.

Therefore, it is highly unlikely that there would be any significant adverse effects associated with nutrient losses from the proposed activity on groundwater. The groundwater quality is not considered degraded, and the nitrate-nitrogen levels well below the drinking water limit. Therefore, the proposed continuation of dairy farming on the subject site is expected to maintain groundwater quality.

Bores in and around the FDE discharge area are wellhead protected and sealed with steel caps, which effectively prevent the ingress of contaminants.

6.2.6 Odour

The effects of odour are most likely to occur from the discharge of FDE. The effluent pond is located at a suitable distance from the property boundaries and nearest dwellings. The physical location of the effluent infrastructure coupled with the proposed application methods and effluent discharge buffers means there is no significant risk of adverse effects from odour from any spray drift (when using these methods) on surrounding landowners and occupiers. As such, any significant adverse effects of odour would be avoided.

6.2.7 Contingency Plans

The pond has a leak detection system and inspection chamber, and this acts as a contingency measure in the event of an effluent system failure as the leak detection system will show there is a leak.

A slurry tanker and the umbilical may be used at certain times if the usual methods of effluent discharge are under repair or if conditions allow for more effluent to be applied than the usual system is capable of conveying. Any discharges from the slurry tanker must adhere to the rate and depth limits imposed on the consent.

See the applicants FEMP.

6.3 Assessment of Effects – Groundwater Abstraction for Dairy Operation

6.3.1 Allocation

The application seeks consent to abstract groundwater at a maximum rate of 179.6 m^3 per day and at a maximum seasonal allocation limit of 52,560 m^3. The daily rate equates to a total of 140 litres/cow/day for 1,200 cows, 45 L/cow/day for bulls and youngstock and 35 L/cow/day for a young calf.

The seasonal allocation has been determined as 120 L/cow/day for 1,200 cows, for 365 days of year. This provides sufficient water for the 1,200-cow milking heard, bulls, wintered dairy cows, youngstock and calves when averaged over the year.

The property is located outside of any mapped groundwater management zone.

The applicant is applying to increase daily maximum groundwater take from the current consented limits to accommodate the increase in cow numbers. The proposed take will be 2 L/s when averaged over a 24hr period, and therefore is not considered for stream depletion under the RWP or pSWLP.

The abstraction is from an aquifer outside of the named groundwater zones. Available information on the groundwater resource and groundwater volumes is not well understood. As part of the 2020 water permit granted for this property, Council's Technical Specialist (Groundwater) calculated the land surface recharge for the farm was 344,935 m^3 (RWP) and 241,448 m^3 (pSWLP), therefore the applicant is proposing to take

15% (RWP) and 22% (pSWLP) of the land surface recharge for the operation annually.

On this basis, the proposed abstraction is within primary allocations limits.

6.3.2 Stream Depletion and Interference Effects

Policy 29 in the RWPS and Policy 23 of the pSWLP requires a stream depletion assessment when the daily average rate of take is more than 2 L/s because takes less than this are expected to have a minor effect on stream flows. As the proposed take is 2 L/day, over 24 hours of pumping, a stream depletion assessment is not required.

Significant interference effects on neighbouring bores are not expected as an array of bores are available for abstraction, and if a subset or single bores are used from time to time, the average rate of take is relatively low, it is unlikely that the radius of interference would affect any of these bores.

6.3.3 Effects on Groundwater Quality

The low rate of take is highly unlikely to result in the drawdown of contaminants from the upper soil profiles and so the proposed abstraction is highly unlikely to have any significant adverse effects on groundwater quality. The applicant confirms that the bore head casing on the bore is adequately sealed to prevent contamination.

6.3.4 Efficiency of Use

The proposed rate of take is based on:

- Dairy cow peak, 140 L/cow/day (wash and drinking)
- Dairy cow annual average, 120 L/cow/day (wash and drinking)
- Dairy cow wintered, bulls, youngstock, 45 L/cow/day
- Calves, 35 L/cow/day

The Horizons Regional Council, "Reasonable Stock Water Requirements Guidelines for Resource Consent Applications" has been used as guide.

The annual allocation has been determined at 120 L/cow/day for 1,200 cows this being the average annual volume based on industry best standards. This has been multiplied by 365 days to represent the annual average water required for all stock classes on the property.

The applicant intends to continue monitoring abstraction from the bore to ensure the rate of take is not more than what is proposed as part of this application.

6.4 Assessment of Effects – Dairy Expansion

This assessment of environmental effects (AEE) describes the risks to the environment resulting from the expansion of the dairy platform (from 370.9 ha to 536.8 ha), with 288.7 ha of neighbouring dairy support land to be retired and planted in forestry, and addition of 300 cows (from 900 to 1,200).

This assessment below considers the specific surface water quality issues in the existing receiving environment at the nearest monitoring sites. It looks at the property scale, and the likely contaminant pathways that may impact any local water quality issues identified. Any potential water quality issue is considered relative to the proposal, including farm system changes proposed and OverseerFM nutrient budgets, GMPs and mitigations, including their effectiveness and appropriateness, and the contribution that these measures would provide to water quality improvements at the catchment scale.

Policy 5 of the NPSFM requires that freshwater be managed to improve the health and well-being of degraded water bodies. Te mana o te Wai includes ki uta ki tai, which includes the integrated approach, gives greater emphasis to the connection between activities upstream and the effects in the lower catchment and estuary. Objective 6, Objective 8, and Policy 15 of the PSWLP requires that where water quality is degraded it be improved. These policies and objectives, and assessment, are discussed in the following section, and later in Section 7.

Good management practices are managed through the Farm Environmental Management Plan, see Appendix A.

6.4.1 OverseerFM Modelling

OverseerFM modelling using Version 6.4.3 has been included to support this application. OverseerFM has been used to model the farm system, to estimate nutrient losses to water associated with the proposed increase in dairy platform area and cow numbers. Nutrient inputs have been carefully considered to ensure viable farm systems are modelled.

The OverseerFM nutrient budgets have been prepared by Mo Topham who is a Certified Nutrient Management Adviser (CNMA) and reviewed by Miranda Hunter who is also a CNMA. These Overseer budgets have been used to estimate the annual amounts of nitrogen and phosphorus losses to water from the property.

Please refer to Appendix C for Nutrient Budget Summary Report as provided by CNMA Advisor which further details the inputs for each farm system scenario.

Table 9: Summary nutrient budgets.

Nutrient	*Current Year ending 2020*	*Proposed Fawna Farms expanded dairy farm, and IFS Growth forestry*	*% Difference*
Total Farm N Loss (kg/year)	31,706	29,565	-6.8%
Total Farm P Loss (kg/year)	1,069	648	-39.4%

Overall, modelling indicates that at a farm system level:

- Nitrogen losses are estimated to reduce by 2,141 kg N/year (-6.8% reduction) compared to the existing consented baseline.
- Phosphorus losses are estimated by Overseer to reduce by 421 kg of P/year (-39.4 % decrease).

The reductions in nutrient losses are discussed further below.

6.4.2 Mitigations and GMPs

OverseerFM estimates what the losses of N and P to water will be, but not what the potential or actual effects of that loss on water quality would be. OverseerFM does not predict transformation, attenuation, or dilution of nutrient between the root zone and the farm boundary. The effects of the proposal on water quality are assessed in this section.

The contaminants of concern are N, P and sediment and microbiological contaminants. These contaminants and their potential adverse effects are outlined below:

- **Nitrogen (N) and phosphorus (P)** (nutrients) are needed by plants for growth but when the concentrations of nutrients in water are high, they can result in excessive growth of plants, e.g., periphyton, macrophytes and phytoplankton. High concentrations of nitrate in water can make it unsafe to drink for humans and can be toxic for sensitive organisms (like young trout and salmon). Ammonia at sufficiently high concentrations can be highly toxic to fish and other aquatic organisms that live in water.
- **Sediment** (as indicated by water clarity) refers to particles or eroded soil and rock. Sediment is also a major source of phosphorus because phosphorus sticks to the surface of soil particles carried to water. When erosion rates are excessive, sediment can smother stream and estuary bed macroinvertebrates and can damage the gills of fish. Finer sediment suspended in water can also reduce light penetration (visibility) which plants need to grow and some creatures need to find food.
- **Faecal indicator micro-organisms** (indicators of microbial pathogens) which can have a detrimental effect on human and animal health, particularly when ingested. The main source of pathogens in fresh water in New Zealand are human sewage and animal manure[4].

Assessing the environmental impact of modelled nutrient losses from a property is complex because these nutrients travel via a number of different pathways through the receiving environment undergoing attenuation, mixing, dilution and dispersion processes which can significantly affect the loading and concentrations that result in the receiving water bodies.

A combination of the farm system changes, and mitigation measures as demonstrated by the nutrient modelling undertaken will result in significantly less phosphorus, and some N, making its way into water bodies which will contribute to improving the quality of groundwater and surface water.

Overall, the nutrient budgets predict a 6.8% reduction in nitrogen and 39.4% reduction in phosphorus for the proposed expanded Fawna Farms dairy farm and IFS forestry block in comparison to the year ending 2020 land use.

[4] Parliamentary Commissioner for the Environment, 2012. *Water quality in New Zealand: Understanding the science.* New Zealand Government, Wellington. 76p.

These reductions are the result of the below mitigations:

- A reduction in grazed area due to conversion to forestry
- Reduction in fertiliser applied on winter crops.
- Decrease in phosphorus fertiliser use.
- Overall reduction in stocking capacity as measured by RSU[5] across the entire landholding.
- Reduction in RSU per hectare on the original Fawna Farms dairy area
- Increase in effluent disposal area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed.
- Removal of stock access to waterways.

Other proposed mitigations not rewarded through the OverseerFM model include:

- A 10m buffer from all waterways to winter forage crops (grazed 1 May to 30 September), where the buffer will be uncultivated and retained in pasture.
- Planting of 5.5ha area between dairy shed and Gap creek.
- Buffers applied in new forestry block between existing vegetation, and waterways.

These, and others proposed are expanded on in the table below.

There is potential for some of the below mitigations to provide additional reductions in contaminant loss to water as some are not fully recognised in Overseer. The numeric quantification of the mitigation not rewarded in Overseer has not been completed given the extent of existing and proposed works.

Furthermore, OverseerFM does not reward farmers for implementing good management practices related to exclusion of CSAs from intensive winter grazing and does not allow bespoke slope inputs for crop paddock.

Furthermore, the planting of 288.7 ha of forestry is expected to provide a positive benefit and sequester carbon. This positive effect is not accounted for and is expanded on in later sections of this report. Nevertheless, the application is carbon positive, and benefit will be provided by the new forestry, and change in farm system which provides for lower agricultural emissions, de-intensification on an RSU/ha basis, compared to the current system.

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[5] RSU means revised stock unit and is defined as an animal with an intake of 6,000 MJ ME intake per year. RSU is useful for assessing and comparing a farm's carrying capacity, i.e., how intensive a farm is, or the number of animals that can be grazed in a certain period. This enables the carrying capacity of dairy and non-dairy systems to be compared.

Table 10: Summary of mitigations proposed, the purpose and expected outcome.

Mitigations that address Water Quality	**Included in Overseer or not.**	**Purpose & Outcome**
1. Reduction in RSU and decrease in cows/ha. Change in stock type.	Included in Overseer	A revised stock unit (RSU) is defined as an animal with an intake of 6,000 MJ ME intake per year. RSU is also useful for assessing and comparing a farm's carrying capacity. This enables the carrying capacity of dairy and non-dairy systems to be compared, based on feed intake. Therefore, a reduction in RSU as proposed (-14.1%) shows that the expanded dairy system is operating less intensively than the previous farming system being dairy + dairy support, sheep, and beef trading. The RSU decrease is a combination of changes including, less youngstock classes, e.g., young bulls, or lambs, and so less actively growing stock, forestry and retirement of grazing land, production per cow is proposed at a lower level versus the current dairy farm.
2. Conversion to plantation forestry.	Included in Overseer	Retirement of the steep hill county and planting in plantation forestry provides for the below: • Less soil disturbance by hooves • Greater vegetative cover (rank grass first, and then trees later) will slow down water as it runs off land reducing sediment/phosphorus losses and sheet erosion • Vegetative and the canopy created by trees reduces the speed of fall rain and dissipate impact energy when raindrops hit soil and therefore reduce sediment loss via sheet erosion • The decrease in P loss estimated by OverseerFM from the pastoral area being converted to forestry is 400 kg P/year in this block alone. • A reduction in winter crop occurring on steeper land favouring more suitable low-slope land. Excess phosphorus in water can cause rapid weed growth or algal blooms which can choke aquatic life and cause long-term damage to the health of a waterbody/overall hauora and mahinga kai species. Reducing the amount of P fertiliser used, minimises the loss of P from the farm to water and will minimise excessive weed growth allowing for mahinga kai sites that are protected from weed, and ensuring mahinga kai is safe to eat. Buffers to fresh waterways within the forestry block will be put in place, along with existing vegetation remining untouched with appropriate setbacks provided for, see Appendix B, also provides for existing freshwater and indigenous vegetation values by protecting these areas. One of the key benefits of planting forestry is carbon sequestration and the positive contribution towards New Zealand's commitments to climate change action. Although the trees have not be rewarded for in the Overseer modelling, there are broader positive effects of this conversion from pastoral land to forestry. This is further discussed further below.
3. Planting of 5.5 ha face between dairy shed and Gap Creek	Not rewarded in Overseer	Vegetated buffers are proven successful methods to mitigate nitrogen. Literature shows that wide buffers can provide nitrogen attenuation levels of 27% (winter), and up to 93% (summer), whereas for phosphorus buffers provide 43% removal when buffers are >4m, for sediment and microbial contaminants buffers provide 74% removal when >4m, and function as a large

		filter to capture contaminants, absorb nutrients, before these can enter water[6, 7]. Buffers, and stock exclusion from CSAs are an effective mitigator of most key contaminants originating in the agricultural setting. This provides for consistent, progressive, measured improvement meeting some of the draft objectives within the Ngāi Tahu ki Murihiku Freshwater Objectives (Paetae Tuatahi and Paetae Tuarua).
4. A 10m buffer from IWG to freshwater	Not rewarded in Overseer	A wider buffer slows the velocity of surface run-off to help filter out any sediment and other contaminants. This is well established in the literature, with reports from the late 1980s confirming the benefit of wider buffers, at or greater than 10m.[8] There are two primary drivers[9] that reduce contaminant loss within wide buffer zones 1) infiltration within the buffer zone which reduces runoff reaching the waterway, reducing the contaminants loss; and 2) the reduction of flow velocity due to the rough vegetation, allowing the sediment to settle out in the grass strip left.

6.5 Catchment Water Quality and Cumulative Effects

The applicant's farm is located within an unclassified groundwater zone. The median TON concentration from bores within 5km around the farm is 0.005 mg/l and is considerably less than the drinking water standard. The OverseerFM modelling indicates a small improvement in N losses to water is likely to occur. The proposed good management to be adopted by the applicant by way of FEMP will further mitigate effects of deep drainage.

The dominant contaminant pathway on the property is overland flow, and minimising contamination of surface water has been the primary focus of the mitigations proposed.

Sediment and microbiological contaminants are not modelled within OverseerFM so attempting to demonstrate a reduction in the annual amount of sediment and microbiological contaminants in the proposed scenario compared to the amount which has been lawfully discharged currently is challenging. P loss modelling can be used as a proxy for sediment and microbiological contaminant losses. The reason is that P in the soil readily bonds to fine soil particles and is therefore lost to the environment via the same contaminant pathways: runoff/overland flow and erosion. Microbiological contaminants are also lost to the environment by the mechanics of water flow via these same pathways. The P loss modelling in this application indicates sediment and microbiological contaminants will decrease significantly, in the order of 39%, under the proposal. However, P loss prediction is not exactly the same as microbial and sediment losses,

[6] Low H, McNab I, Brennan J. Mitigating nutrient loss from pastoral and crop farms. A review of New Zealand Literature. Horizons Regional Council.

[7] McDowell R, Wilcock B, Hamilton D. (2013). Assessment of Strategies to Mitigate the Impact or Loss of Contaminants from Agricultural Land to Fresh Waters

[8] Smith C 1989. Riparian pasture retirement effects on sediment, phosphorus and nitrogen in channelized surface run-off from pastures. New Zealand Journal of Marine and Freshwater Research 23: 139-146.

[9] Gharabaghi B, Rudra R, Goel P 2006. Effectiveness of vegetative filter strips in removal of sediments from overland flow. Water Quality Research Journal of Canada 41: 275-282.

and therefore the assessment is an estimate but provides an acceptable indication of likely losses and risks to the environment.

The specific N and P losses from the applicant's farm are summarised in Table 9 and demonstrates that a small (-6.8%) reduction in N losses to water is likely to occur under the proposed scenario, with a modelled -39.4% reduction in P loss to water, compared to the existing baseline which represents the pre-2 September 2020 land use.

Based on the reductions expected to occur it is likely that the applicant's proposal is consistent with Regulation 24 of the NESF, and that loads, and concentration of key contaminants will not increase, particularly as the baseline OverseerFM model used is for the 2019/2020 year, which represents farm loses prior to 2 September 2020.

We do not have detailed knowledge of other sources of contaminants in the catchment, and there is no catchment baseline contaminant loses known to assess the overall likely reduction as a percentage.

The primary contaminant pathway on the new land is overland flow, which is the primary mechanism of transport for phosphorus, sediment, and bacterial contaminants. A 39.4% reduction in P provides a strong indication that overland flow of these contaminants is significantly reduced at the local scale.

The reduction in catchment loading of N and P expected as a result of this proposal is small when considering the percentage area that the farm makes up over the total catchment drainage area. Therefore, we have focused on local water quality. The mitigations outlined in Table 10 are expected to result in contaminant loads and concentrations in the local catchment that are no greater than what was occurring at close of 2 September 2020. Consistent with Regulation 24 of the NESF.

The land relevant to this application is 825.5 ha (dairy farm and forestry block) and the Orauea River at the Orawia Pukemaori Road water quality monitoring site is 445.3 km^2, or 44,530 ha, and so the farms make up 1.8% of the wider catchment area for the Orauea River. This would be much smaller for the Waiau River Catchment. For this reason, it is very difficult to translate the estimated local improvement in water quality, even though significant at 39.4% for phosphorus, for example, to the wider catchment.

The attached FEMP details various management practices implemented on farm to reduce the effects of key contaminant pathways. The primary mechanisms of mitigating and avoiding these losses are by retirement of steep land from pastoral farming and intensive winter grazing, appropriate management of critical source areas on the farm, efficient effluent management, stock exclusion from riparian margins and CSAs and the adoption of above best management practices for intensive winter grazing, including use of wider (10m) buffers during IWG period.

In relation to the link between water quantity/quality, farming, and climate change, this proposal is carbon positive. The ability of the forestry to sequester carbon has not been taken into account at this time due to the assumptions required by OverseerFM to calculate this. Furthermore, the forestry will be entered into the

ETS and subsequently contribute to meeting New Zealand's climate change obligations and is not relevant to this proposal at this time.

In relation to forestry, over the first 16 years of the forests life it is forecast to store circa 120,000 ton of carbon. To put this into perspective, New Zealand's total 2019 Co2 emissions (gross) were 37.5 million tons[10], divided by the 2019 population (Dec 2019 - 5,040,000 million[11]) gives approx. 7 ton of carbon per annum per person on average, for 2019. At 120,000 tons of carbon sequestration in the first 16 years, the proposed forest will offset the Co2 emissions of approx. 17,000 people in Southland for one year.

The total agricultural emissions for the current farming system are expected to reduce by >10% under the proposal. As a result of the farm system change proposed, and excluding any effect of carbon sequestration through forestry, the proposed methane and nitrous oxide emissions from the proposed farm system represent a positive shift to farming with less greenhouse gas emissions.

The FEMP for Fawna Farms Ltd includes a section detailing the impact of the operation on climate change, including any actions that could be implemented to mitigate or offset these impacts over time. These are not necessarily proposed mitigations.

There will be ongoing obligations in relation to greenhouse gas emissions, and through the likes of He Waka Eke Noa there will be pathways available for agricultural emitters to capture the benefits of changes made on farm. The proposal has not yet accounted for current, and future mitigations on farm, such as riparian planting, and decreased nitrogen fertiliser use, which are all likely to result further overall landholding reductions in greenhouse gas emissions.

Overtime, the quantification of these improvements will be included through the FEMP process. Overall, the broader cumulative effects of the proposal provide benefits to both water quality of the local and wider catchment through nutrient offsetting, along with opportunities for carbon offsetting in future through planting of trees, and a farm system change with estimate less agricultural emission of methane and nitrous oxide.

As described above, the proposal is very likely to achieve a reduction in annual N and P loss, and sediment and microorganisms, to water as indicated by OverseerFM modelling and the mitigations proposed that directly minimise the effects of overland flow of contaminants to water.

Improvements made under the proposal in isolation from other farms will only have an extremely small impact on long-term water quality. This highlights the importance of catchment wide implementation in water quality mitigation measures and the ongoing restriction on the applicants' operation in accordance with the nutrient output limits will give certainty that water quality will be improved in the long term.

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[10] https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions
[11] https://www.stats.govt.nz/topics/population

One purpose of the proposal is to enable the farm to run as a self-contained dairy farm, whilst spreading the wintering activities over a larger land holding and making more feed on farm; the amalgamation of the two blocks will help balance the milking platform activities, raising of young stock, production of feed, and wintering of cows. Being self-contained means the consent holder has full control and does not rely on third party contracts to winter stock and/or graze youngstock elsewhere in the catchment or region.

6.6 Effects on Statutory Acknowledgement Area

The Waiau River is a Statutory Acknowledgement Area under the Ngāi Tahu Settlement Act 1998 due to its tribal significance. Iwi planning documents are not statutory instruments, but they do have statutory weight under the RMA in relation to the plan preparation process. The RPS must take into account any relevant planning document recognised by an iwi authority, however, iwi management plans retain their ability to address concepts from a Māori paradigm without constraint from the RMA.

The Fawna Farms Ltd property is located within the Waiau catchment, and Schedule 69 of the Ngāi Tahu Claims Settlement, 1998.

A cultural policies assessment and effects on cultural values is considered elsewhere in this report. See section 7.2.2.5.

Careful consideration has been given to Ngāi Tahu ki Murihiku Freshwater Objectives (2020), Draft Murihiku Southland Freshwater Objectives: Providing for hauora, the health and well-being of waterbodies in Murihiku Southland (2020), and The Cry of the People Te Tangi a Tauira Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan (2008).

These documents provide a very clear statement for the concerns of tangata whenua in Murihiku Southland. We understand the concerns of rūnanga about the quality of freshwater and land use activities that can affect water quality.

We appreciate the significance of the Waiau River and the cultural impacts of the history of activities that have affected the quality, quantity, hauora and mauri of the river. We also understand the concern that resource consent applications need to explicitly take into account the cultural values and needs of tangata whenua.

This proposal to expand the dairy farm incorporates a significant shift in farm system on both the existing dairy farm and the dairy support, sheep and beef trading block to be incorporated as new dairy platform, furthermore, there is 288.7 ha of pastoral land to be retired and planted in planation forestry. Therefore, we believe that the proposal will result in a reduction in of contaminants entering water.

We acknowledge the changes proposed may not be enough to result in measurable changes in water quality or measurable improvements in the health or hauora of waterways catchment wide, this is because the farm is a small piece of a much bigger puzzle. However, if all land users and discharges in the catchment adopted similar approaches there would be significant meaningful improvements. The proposed planting of forestry and retirement of 288.7 ha of pastoral land is a significant shift and offers opportunities to IFS Growth Ltd and Fawna Farms Ltd (the two collaborating landowners) to be leaders in this space.

6.7 Positive effects

The continuation of dairy farming will contribute significantly to the social and economic wellbeing of the local and regional community.

The proposal is carbon positive, and will result in a local water quality improvement, which will overall contribute to an improvement at the catchment level, although small and likely immeasurable. The proposal represents a positive step towards significant meaningful improvement in the Waiau catchment, and includes the retirement of pastoral land and planting of 288.7 ha of plantation forestry.

6.8 Other Assessment Matters

In accordance with Clause 7 of Schedule 4 of the RMA the following provides an assessment of the activity's effects on the environment:

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

Throughout the duration of the existing consents, there have been no known complaints from neighbours, which indicates that the potential adverse effects on the neighbourhood are less than minor.

The proposal will result in net positive benefits to the neighbourhood as there will be capacity to provide for the social and economic benefits with the employment of staff, as well as contractors and consultants, and the farm is serviced by local schools and many businesses that would not benefit if the activities were unable to occur. The ability for the applicant to continue to operate their dairying operation will enable them to provide for their own social, economic and cultural wellbeing.

The proposal is considered to be consistent with the relevant policies of the Iwi Management Plan (Te Tangi a Tairua).

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

In terms of landscape and visual effects, the presence of effluent irrigation, other farming equipment and cows is expected within the rural locality. The proposal will not have any significant physical effects on the locality over and above that currently experienced.

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

The dairy farm is located within a highly modified ecological landscape and the proposal will not have any significant adverse effects on ecosystems above that which has been occurring for many decades.

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

It is not considered that the activities will have any effect on aesthetic values, as the existing dairy platform is established and in keeping with the general rural nature of the area. The land in this area is historically known for farming activity, and the presence of a dairy operation on this property does not result in any effect contrary to the historical values associated with the natural and physical resources in the vicinity.

The waterways within the proposed dairy platform are non-navigable and public access would be by permission of the applicant only. The effects on any cultural values are assessed below.

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

Effluent is proposed to continue to be treated and discharged to land as described earlier in this report. The assessment of alternatives provided in this report has concluded that this is the preferred solution for managing FDE generated at the property. The activity is in keeping with the rural nature of the area, therefore it is not considered there will be any unreasonable emission of noise or odour.

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

All hazardous materials carried and used onsite will comply with the relevant rules of the Part operative Southland District Plan 2012, and the Hazardous Substances and New Organisms Act 1996. As such, there will be no risk to the neighbourhood, wider community or the environment due to natural hazards or the use of hazardous substances or hazardous installations.

7. STATUTORY CONSIDERATIONS

Schedule 4 of the RMA requires that an assessment of the activity against the matters set out in Part 2 and any relevant provisions of a document referred to in Section 104 of the RMA is provided when applying for a resource consent for any activity. These matters are assessed as follows.

7.1 Part 2 of the RMA

The proposal is consistent with the purpose and principles of the RMA, as outlined in Section 5. The proposal will have less than minor effect on the catchment's ability to meet the reasonably foreseeable needs of future generations, both surface water and groundwater, or on the life-supporting capacity of these water resources and any ecosystems associated with them. The proposal ensures that adverse effects on the environment are mitigated.

There are no matters of national importance under Section 6 of the RMA that will be affected by the proposal. The proposal is also consistent with the requirements of Section 7 of the RMA, with particular regard given to the efficient use and development of natural and physical resources. Regarding Section 8, the proposed activity is not inconsistent with the principles of the Treaty of Waitangi.

Overall, the activity is considered to be consistent with Part 2 of the RMA, given the minor nature of the activities and the proposed mitigation.

7.2 Section 104(1)(b) of the RMA

In accordance with Schedule 4 of the RMA, an assessment of the activity against the relevant provisions of a document referred to in 104(1)(b) of the RMA must be included in an application for resource consent. Documentation in this section are noted as being:

(i) a National Environmental Standard;

(ii) other regulations;

(iii) a National Policy Statement;

(iv) a New Zealand Coastal Policy Statement;

(v) a Regional Policy Statement or Proposed Regional Policy Statement;

(vi) a plan or proposed plan.

Under the RMA, regional plans need to give effect to NPSs, NESs and RPSs. For an application of this scale, an assessment of the application against the regional plan is often adequate as these plans ultimately give effect to the higher order statutory instruments. As such, no individual assessment has been made against the National Environmental Standard for Sources of Human Drinking Water. An assessment has been made against the recently released National Environmental Standard for Freshwater (2020) and National Policy Statement for Freshwater Management (2020) as these contain the most up to date national policy directions that need to be considered.

Relevant policies from the RWPS, and the PSWLP are considered relevant to this application and are assessed below. The rules and policies in PSWLP have legal effect from the date of notification and weight must be given to the policies contained in PSWLP alongside the existing policies in the RWPS.

7.2.1 National Policy Statement for Freshwater Management 2020

The National Policy Statement for Freshwater Management 2020 (NPS-FM) recently came into force on 3 September 2020. This document is a national direction for managing freshwater in New Zealand and has been introduced alongside some relevant National Environmental Standards for Freshwater. A detailed assessment of this application against each of the NPS-FM policies is not considered necessary. However, because both the RWPS and PSWLP were given legal effect prior to the NPS-FM coming into effect it is considered appropriate to undertake a brief assessment of the proposal against the objectives and policies of the NPS-FM (2020).

The policies of particular relevance to this application for resource consent are outlined below. The proposal has been carefully considered against Te Mana o te Wai, the objective and all relevant policies listed below and in the context of the detailed assessment of effects is strongly considered to be consistent with all the relevant provisions of the NPS-FM.

The fundamental concept underpinning the NPS-FM (2020) is Te Mana o te Wai, that is recognising the fundamental importance of water and the health of water in protecting the health and well-being of the wider environment. Within the context of the NPS-FM this encompasses 6 principles relating to the roles of tangata whenua and New Zealand in the management of freshwater and the implementation of the NPS-FM.

The NPS-FM (2020) also sets out a hierarchy of obligations and an objective for Te Mana o Te Wai that prioritises first the health and wellbeing of water bodies and freshwater ecosystems over second the health needs of people, and third, the ability of people and communities to provide for their social, economic, cultural well-being.

A number of the principles set out for Te Mana o te Wai are directly relevant to Councils in giving effect to the NPSFM (for example through plan making processes), as they focus on tangata whenua's authority and responsibility and actions, as well as governance by the council. Many of the principles are more difficult for an applicant to give effect to. The two principles that stand out as relevant are the following:

> *"(e) Stewardship: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generation."*
>
> *"(f) Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation."*

This proposal has been carefully considered against *Te Mana o te Wai,* the objective and all relevant policies, and in the context of the detailed assessment of effects is strongly considered to be consistent with all the relevant provisions of the NPSFM. For the reasons given in the assessment of effects above in Section 6, this balance has been found a reduction in nitrogen and phosphorus as proposed by this application and use of mitigation/GMPs across the dairy farm.

Further discussion of relevant policies within the NPS-FW (2020) is provided in the table below.

Table 11: Applicable policies from the NPS-FW (2020).

Policy	Wording	Comment
1	Freshwater is managed in a way that gives effect to *Te Mana o te Wai*.	See above discussion. The proposal includes mitigations on the dairy farm to ensure the health and wellbeing of water bodies are provided for. Table 10 sets out how the proposed mitigations align with Ngāi Tahu ki Murihiku Freshwater Objectives (2020), the draft Murihiku Southland Freshwater Objectives: Providing for hauora improvements over time.
2	*Tangata whenua* are actively involved in freshwater management (including decision making processes) and Māori freshwater values are identified and provided for.	See above discussion.

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.	Surface water quality in the wider receiving environment is considered to be generally poor when assessed against the objectives within the NPSFM national objective framework. The OverseerFM modelling of the proposed farm system in its entirety models that nitrogen losses to below the root zone will reduce by a 7% and an 39% reduction in annual phosphorus loss to water. Using the reduction in P as a proxy, there is also a high likelihood of a reduction in sediment and microbial organisms. The health and well-being of the receiving environments is predicted to improve as a result of the proposal as described, as the result of the mitigations included within the Overseer nutrient budget and the mitigations related to riparian buffers offer opportunity for a significant improvement in water quality. Table 10 sets out how the proposed mitigations that will improve water quality.
4	Freshwater is managed as part of New Zealand's integrated response to climate change.	Same as for Policy 3. Climate change is a matter addressed through the FEMP (Appendix A). The FEMP includes a section detailing the impact of the operation on climate change, including estimated greenhouse gas emissions and any actions that could be implemented to mitigate or offset these impacts over time. These are not necessarily proposed mitigations. Greenhouse gas emissions are currently not a relevant matter under the Resource Management Act and He Waka Eke Noa and the Emissions Trading Scheme are proposed to address greenhouse gas emissions in New Zealand. The proposal has not yet accounted for current, and future greenhouse gas mitigations on farm, such as riparian planting, the sequestration from the proposed 288.7 ha of forestry, or and decreased nitrogen fertiliser use; which are all likely to result in an overall landholding reduction in greenhouse gas emissions. Overtime, the quantification of these improvements will be included through the FEMP process.
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.	Same as for Policy 3.
12	The national target (as set out in Appendix 3) for water quality improvement is achieved.	Same as for Policy 3.
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.	Water quality monitoring on the Orauea River is undertaken by ES under the State of the Environment monitoring programme. The proposal includes simultaneous monitoring and management of nutrient inputs and outputs from the farm via OverseerFM nutrient budgets and the FEMP in order to identify areas of improvement which could improve water quality.

15	Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement."	The expansion the dairy farm provides greater opportunities for the local economy in terms of permanent jobs and support of local schools and communities. Positive economic, social and cultural well-being should result.

7.2.2 Regional Plans, NESFW, and Te Tangi a Tauira

Relevant policies from the RWPS, and the PSWLP are considered relevant to this application and are assessed below. The rules and policies in PSWLP have legal effect from the date of notification and weight must be given to the policies contained in PSWLP alongside the existing policies in the RWPS. Consideration of the National Environmental Standard for Freshwater water 2020 and IWI Management Plan – Te Tangi a Tauira are also included below.

7.2.2.1 Discharge of Effluent

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Objective: RURAL.1, 2, Policy: Rural 1, 2, 4, 5
Regional Water Plan for Southland	Objectives: 9A, 9B, 9C Polices: 7, 31A, 31C, 31D, 41, 42, 42A, 43
Proposed Southland Water and Land Plan	Objectives: 13, 13A, 13B Policies: 13, 14, 17, 40, 41
Te Tangi a Tauira	Section: 3.5.1

Objective RURAL.1 enables the sustainable management of Southland's rural land resource. The proposal includes limits on effluent application, in order to maintain the life supporting capacity of soils (RURAL.2).

The assessment of effects has demonstrated effluent can be discharged in a way that enables FDE to be used as an organic fertiliser. The proposal is consistent with Policy 17 of the PSWLP and operates in accordance with a FEMP and CAEMP to manage agricultural effluent. The use of low rate discharge methods, and large area of low-risk soils within the FDE disposal area ensures that effluent is applied at a rate and depth that is suitable to the conditions of the subject site, and so that the effluent applied can be used as an organic fertiliser.

Consistent with Te Tangi a Tauira adverse effects on soils and water resources as a result of spray irrigation of dairy effluent to land are mitigated, and effluent entering waterways avoided. Discharge to land in areas with soils that are higher risk is managed by low-rate application methods. The maximum loading rate of nitrogen onto any land area is well within industry and Council best practice.

7.2.2.2 Abstraction of Groundwater

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Objectives: WQUAN.1, WQUAN.2 Policies: WQUAN.1, WQUAN.2, WQUAN.4, WQUAN.5, WQUAN.6, WQUAN.8
Regional Water Plan for Southland	Objective: 5, 7, 8, 9 Polices: B7, 14A, 14B, 21, 22, 23, 25, 26, 28, 29, 30, 31
Proposed Southland Water and Land Plan	Objectives: 1, 7, 11, 12, Policies: B7, 20, 21, 22, 23, 24, 27, 40, 41, 42
Te Tangi a Tauira	Section: 3.5.14

Objective WQUAN.1 enables the sustainable management of the region's freshwater resources. The proposal includes limits on water use so that allocation is maintained, and this is consistent with the 2014 version of the NPSFM that this objective refers to. The discussion above in relation to the 2020 NPSFM covers allocation in-light of Te Mana o te Wai.

The proposed increase in water is considered efficient based on the reasonable needs of stock for drinking water and consistent with industry practice.

With regards to other Regional Policy Statement Objective and Polices, the assessment of effects has demonstrated aquifer values are unlikely to be affected by the proposal, the intended use of water is efficient, overallocation is avoided, demand for water is managed through allocation limits metering is in place to ensure excess taking does not occur and remains within limits of consent.

The proposal is consistent with Policy 20 to 23 of the PSWLP and manages water resources so that the significant adverse effects on the long-term sustainability, reliability of supply for existing water users, groundwater levels and water quality are avoided, mitigated, or remedied.

The proposal will provide benefits to the applicant and the local community, and the use of the resource is considered an efficient use. Water allocation is managed in accordance with Policy 21 and this proposal does not seek to over-allocate the existing water resources and that abstraction will not exceed land surface recharge limits.

The proposed increase in abstraction is consistent with Te Tangi a Tauira as the proposed increase is not unsustainable within the groundwater zone (although is unclassified by Environment Southland). The scale of effects of groundwater abstraction is relatively well understood, and consisted of to be less than minor, especially given the low rate of take. There is no measurable stream depletion effect due to the low rate of take, and therefore this proposal is not expected to deteriorate the water quality of the Orauea River as a result of a reduction in water quantity, as such it is not expected that there is any cumulative effects of water abstractions on surface and groundwater quantity and quality.

7.2.2.3 Land Use – Dairy Farming

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Objective: RURAL.1, 2, Policy: Rural 1, 2, 4, 5
Regional Water Plan for Southland	Policies: 13A
Proposed Southland Water and Land Plan	Objective: 1, 2, 18, Policy: 6, 10, 17, 18, 39A, 40, 41
Te Tangi a Tauira	Section: 3.5.1, 3.5.10, 3.5.11

The Regional Policy Statement ensures the sustainable use of rural land resources, and that the life supporting capacity of soils is safeguarded. The proposed increase in cows and dairy platform land area does not contravene these objectives or associated policies. The assessment has demonstrated that positive effects to the social, economic, and cultural wellbeing will result as a consequence of the proposal, and the effects of the farms development will be sustainably managed through the use of GMPs that ensure protection of soil properties and prevent erosion, compaction, and unnecessary disturbance.

Policies 6 and 10 of the PSWLP appear to have equal weighing, and the proposal is consistent with each of these. We have considered the effects of the activities in the context of the farms physiographic characteristics and conclude that expanded dairy activities will have a negligible effect on water quality, with a focus on overland flow pathways in the gleyed and bedrock/hill country zones.

Furthermore, the proposed expansion provides for improved farm systems and pasture that will over time contribute to improved environmental outcomes and a reduction in nutrient loading; and less agricultural emissions of methane and nitrous oxide compared to the previous farm system. The continuation of farming would provide for the economic and social well-being of the applicant and the communities they support. The proposal is consistent with the objectives and policies in the SRPS and Policy 13 of the PSWLP by supporting the sustainable use and development of rural land resources, both environmentally and economically, if undertaken in the manner as proposed.

The applicant has implemented a FEMP which is in accordance with Appendix N of the PSWLP. Good Management Practices (GMPs) and mitigations are most effective at the farm scale if they are targeted to the risk area, in this instance the effects of combined deferred FDE storage (4-5 time larger than required), greater flexibility to better utilise the less vulnerable areas of the farm and match farming activity to the contour of the land, and adherence to the appropriate buffer zones between water bodies and grazed areas, including IWG management, will successfully avoid or mitigate adverse effects to a practical minimum where they are less than minor. Sediment run-off is managed to a level that it is low risk for the farm system proposed. The FEMP identifies the critical source areas on the landholding and describes how they will be managed by the applicant to minimise nutrient losses at these points.

Compaction of soils as a result of increased number of cows on farm is not anticipated as RSU overall is decreasing, and RSU/ha is decreasing on the existing Fawna Farms dairy farm, and as a proxy for intensity, this proposed system overall is less intensive than the previous based on RSU. Removing IWG from the steep topography has previously will positively contribute to less runoff of sediment from IWG activities on the landholding. Therefore, impacts on the ability of land to absorb effluent and damage from grazing is avoided and mitigated over a larger area, and on crop that is located on low-slope land. The amalgamation of the two blocks will help balance the milking platform activities, production of feed, and wintering of cows. Being self-contained means the consent holder has full control and does not rely on third party contracts to winter stock elsewhere in the catchment or region.

7.2.2.4 Water Quality

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Objectives: WQUAL.1, WQUAL.2 Policies: WQUAL 1, 2, 5, 7, 8, and 9. RURAL.5
Regional Water Plan for Southland	Objectives: 2, 3, 4 Policies: 1A, A4, 1, 3, 6, 7,
Proposed Southland Water and Land Plan	Objectives: 6 and 8, 13B, 18 Policies: 6, 10, A4, 13, 14, 15B, 16, 18, and 39A
Te Tangi a Tauira	Section: 3.5.11, 3.5.13, 3.5.16, 3.5.17, 3.5.19, 3.5.20

Objective WQUAL.1 is of significant relevance to the proposal as it sets the water quality framework for the management of water quality in Southland. The objective requires four primary things:

- The life supporting capacity of water and related ecosystems is safeguarded;
- The health of people and communities is safeguarded;
- Water quality is maintained or improved in accordance with the National Policy Statement for Freshwater Management 2020;
- Freshwater quality is managed to meet the reasonably foreseeable social, economic and cultural needs of future generations.

Policy 15B requires that where water quality is degraded, water quality be improved and the intent of the policy is to ensures that any decline in water quality is halted, promoting improvement across lowland water bodies. This proposal demonstrates that an improvement in water quality in the local receiving environment is very likely to occur, furthermore nutrient load and concentration is unlikely to increase in receiving environments and Te Waewae Bay. This ensures that water quality is enhanced (Policy 15B, pSWLP) and there is no increase in load or concentration of key contaminants (NESF, Regulation 24).

The proposed dairy platform is within the Bedrock/hill country, Oxidising and Gleyed Physiographic Zones. Policy 6 and 10 requires the implementation of GMPs to manage adverse effects cumulatively and propose GMPs and mitigations (where appropriate) to mitigate and/or avoid effects of the activities on water quality. These GMPs and mitigations are proposed to be implemented by way of a FEMP that has been prepared by the applicant and appended to this application. Genuine attention and thought have been given to the potential adverse effects of the proposal on water quality, in the context of the most likely contaminant pathways.

Policy 16 requires the minimising of adverse environmental effects from farming activities. Part (a) applies as the property is within proximity of the Te Waewae Lagoon is identified as a sensitive waterbody in Appendix A of the PSWLP. This proposal includes an increase in the number of cows and land area that comprises the dairy platform from what is already consented. Therefore, this proposal includes assessment to demonstrate 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 is mitigated, and there the proposal is consistent with Policy 16 as the assessment here demonstrates the GMPs and mitigation that will be applied to minimise adverse environmental effects on the downstream sensitive receiving environments.

Policy 16(1)(b)(iii) likely applies as it is our assumption that no lowland surface water body in Southland meets the Appendix E water quality standards. However, in the context of demonstrating that there will be some improvement in water quality over time as a consequence of the expansion and mitigation proposed, it is considered that the 'generally' component of the policy applies and Policy 15B and the higher objectives would provide an appropriate approach that would support granting applications that have been able to demonstrate that they would result in an improvement in water quality.

Addressing issues identified in Te Tangi a Tauira the run-off of agricultural contaminants, e.g., nitrates and phosphates, in water bodies through accelerated soil erosion are avoided where practicable by appropriate GMPs and mitigation. As a result of these GMPS and mitigation, the water quality of waterways in the Waiau Catchment will be improved, albeit very small and likely immeasurable based on the scale of property in the wider catchment. The consent holder through the proposed mitigations (Table 10) is proposing to improve water quality and run a less intensive expanded dairy farm system in comparison to the previous farm system, and facilities the permanent retirement a large area of pastoral land being planted in forestry.

7.2.2.5 Tangata Whenua

Iwi planning documents are not statutory instruments, but they do have statutory weight under the RMA in relation to the plan preparation process.

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Policies: TW.3
Regional Water Plan for Southland	Polices: 1A
Proposed Southland Water and Land Plan	Objective: 3, 4, 5, 15, Policies: 1, 2, 3, 44,
Te Tangi a Tauira	Section 3.5.1, 3.5.11, 3.5.13, 3.5.14, 3.5.16, 3.5.17, 3.5.19, 3.5.20
Draft Ngāi Tahu ki Murihiku Freshwater Objectives	See below.

The Southland Regional Policy Statement describes the resource management issues important to Ngai Tahu in the Southland regional and includes ensuring tangata whenua is considered in decision making, iwi management plans are recognised, taonga and sites of special significance are protected and food gathering resources are protected. Te Tangi a Tauira is the iwi management plan recognised by Ngai Tahu which encompasses the Southland region. Policies TW.3 and Policy 2 of the PSWLP require iwi management plans to be taken into account.

The application has considered the relevant iwi management plan (Te Tangi a Tauira) and is therefore consistent with Policy 1, 2, and 3 of the PSWLP.

The Ngāi Tahu ki Murikiku Natural Resource and Environmental Iwi Management Plan, 2008 (NREM, a.k.a. *Te Tangi a Tauira)* is the iwi management plan relevant to the Southland Region.

This proposal includes activities which are contained within the property boundaries and with the proposed farm system changes and mitigation/GMPs will ensure that the effects of the activities will not materially impact on tangata whenua values or compromise sites of special significance of food gathering sites. The cumulative effects assessment concludes that any effects felt outside the boundary of the property will not degrade water quality and not impact on cultural values such as mahinga kai.

In addition, the application provides for the following in accordance with Te tangi a tauira:

- The provision of buffer zones to water abstraction sites and waterways;
- The existing riparian margins are protected and improved where practicable;
- Nutrient loading to land is within industry best practice limits;
- The system and management practices are considered appropriate for the risks associated with the receiving environment;
- Water abstraction is to be monitored with metering results to be submitted to Council;
- Regarding Policies 3.5.14.17 and 3.5.1.17, the consent periods proposed are less than 25 years.

Draft Ngāi Tahu ki Murihiku Freshwater Objectives

Te Ao Marama and the Regional Forum have worked together to identify the things that are important to people about water in Southland Murihiku. Environment Southland led the conversation about community values for freshwater in 2019, and then developed draft environmental outcomes (objectives) for different water body classes (rivers, lakes, estuaries, groundwater, wetlands, and open coast). Te Ao Marama led a workstream that followed a similar process to establish values and outcomes (objectives) at a catchment level. The weaving together of the findings into one set of draft environmental outcomes for the whole region subsequently followed.

There are five draft freshwater objectives[12] that have been identified by Ngāi Tahu ki Murihiku to apply within

[12] Ngāi Tahu ki Murihiku Freshwater Objectives (September 2020).

all the freshwater management units. These are expanded on below.

The five draft objectives are:

1. Paetae Tuatahi

The way water is managed will:

- *recognise and provide for rangatiratanga, customary rights and development rights*
- *enable customary use and protection and restoration of cultural heritage, and*
- *utilise and support the intent of Ngāi Tahu Settlement instruments.*

2. Paetae Tuarua

All waterbodies that have been degraded will be returned to a state of hauora, which will in turn improve provision for cultural use and association.

3. Paetae Tuatoru

There will be no further deterioration of waterbodies and consistent, progressive measured improvement where waterbodies have been degraded, towards a state of hauora.

4. Paetae Tuawhā

The goal is to:

- *establish a long term monitoring programme using Ngāi Tahu Indicators of Health that adds to the existing council monitoring programme, and*
- *use Ngāi Tahu Indicators of Health to assess the state of waterbodies and the impact of proposed activities on them, including in resource consent decision-making processes.*

5. Paetae Tuarima

Communities and catchment groups will be supported to understand Ki Uta Ki Tai, Te Mana o te Wai, Hauora and Mahinga Kai, and will be provided with the means to work effectively towards a state of hauora for each waterbody.

We have reviewed the draft objectives, and we consider the proposal to be generally consistent with the direction of the objectives as they appear in the current September 2020 version. With regards to **paetae tuatahi**, this application has considered the statutory acknowledgement area, and in particular mahinga kai which is a core element of cultural use in relation to freshwater and an aspect of living cultural heritage requiring protection, as well as restoration. For the reasons outlined below, the improvement in water quality expected as a result of this proposal will more than likely improve the quality of habitat for mahinga kai, and provide for cultural use and association. The applicant intends to maintain and enhance these areas through managing any critical source area nearby through use of stock exclusion where necessary and buffers, and retirement of land from grazing on the landholding.

Of relevance is the Hauora Plan for the Waiau Freshwater Management Unit. The application for expanded dairying activities as considered Te Mana o te Wai in Section 7.2.1 above, and the proposed improvement in water quality for the farm is a key driver in meeting the principles set out under Te Mana o te Wai. We are confident that the mitigation measures proposed, and change in farm system, will ensure kaitiakitanga will be upheld. This will ensure there is no further degradation of freshwater resources on the farm and will make a contribution to the wider efforts of the Waiau FMU over time. This proposal will result in no further deterioration of freshwater at the farm-scale, and contribute overall (albeit very small) to the wider catchment consistent with **paetae tuatoru** and **paetae tuarua**, including the protection of water in a high quality state.

With regards to long term monitoring (**paetae tuawhā**), the applicant encourages Environment Southland to continue monitoring water quality at the Orauea River SOE site, and to include monitoring of Ngāi Tahu Indicators of Health.

With regards to priorities for protection, the farms contribution to a water quality improvement at the site locality will overtime contribute to an improvement in the wider catchment.

The applicant's proposed groundwater abstraction is efficient for the intended purpose, and it is not anticipated that this is inconsistent with the values asosicated to the aquifer beneath the property. Groundwater quality in this zone is expected to be maintained as a consequence of this proposal, and is well below drinking water limits. Drinking water sites are not expected to be considered affected by the proposal.

Overall, it is anticipated that the approach taken from the consent holder will ensure that the mitigations proposed make contribution to the catching overtime working towards and achieving a state of hauroa.

7.3 Sections 105 and 107 of the RMA

In addition to the matters in Section 104(1) of the RMA, if an application is for a discharge permit a consent authority must have regard to the matters as specified in Section 105.

The discharge of FDE can be undertaken in a manner which avoids contaminants from entering water through controls on application method and conditions of consent. As nutrients can be reused, there is a direct benefit to the property as a method for improving soil fertility. The discharge of effluent to land (low-rate methods) is the best method for avoiding adverse effects on water as might otherwise occur in the event that the discharge was directly to water, which would result in a worse environmental outcome.

There are no matters under Section 107(1) of the RMA that would require the consent authority to decline this application.

There are no practicable alternatives (Section 105(1)) to the application of effluent on to land. The discharge of effluent to land will not result in any of the effects listed in Section 107(1) (c)-(g).

7.4 Section 124 of the RMA

When considering an application affected by section 124 of the RMA the consent authority must have regard to the value of the investment of the existing consent holder. The capital valuation is expected to be in the order of $12 million (Quickmap, Sept 2022).

8. Consent Duration, Review and Lapse

With regard to consent duration, special consideration has been given to Policies 14A and 43 of the RWPS and Policy 40 of the PSWLP, and Te Tangi a Tauira.

Potential effects of the proposed activities are understood reasonably well, and these are to be managed as far as reasonably practicable. Potential adverse effects have in the first instance been mitigated by appropriate management techniques on farm followed by contingency planning, ongoing monitoring and reporting in an auditable format.

A consent term equivalent to an expiry of 31 December 2030 is sought by the applicant. While the water permit and effluent discharge permit are not considered under the NES-F and a 10-year duration could be sought, there are advantages of a common expiry date. A common expiry date is supported by Policy 40(5) for applications which may affect the quality of the same resource. Therefore, a 31 December 2030 common expiration date for all the permits applied for is considered appropriate.

Significant investment has been required just to get to the point of making application with expenditure on professional services, including business feasibility studies, nutrient advice, effluent system review, water quality and policy and planning assessments.

It is considered that granting the 31 December 2030 expiry will enable implementation of any revised framework establish in the FMU section of the PSWLP. Furthermore, this proposal makes substantial steps towards meeting the objectives of the Draft Ngāi Tahu ki Murihiku Freshwater Objectives and recognised the expectations of Hokonui Rūnanga as outlined in Te Kawa o te Taiao.

The applicant is happy for Environment Southland to impose standard review conditions in accordance with Sections 128 and 129 of the RMA. In accordance with Section 125 of the RMA, the applicant seeks a 5-year lapse period for these consents. These consents must not be exercised until any current consents for the same activity have been surrendered or have expired.

9. CONCLUSION

This proposal will see 288.7 ha of pastoral land retired and planted in trees, whilst the existing Fawna Farms Ltd dairy farm will expand, overall, the reduction in RSU (-14.1%) allows for a less intensive farm to operate as a self-contained unit with dairy farming, raising of youngstock and production of feed occurring on farm over the larger landholding. The OverseerFM nutrient budgets estimate a 6.8% reduction in nitrogen lost to water and 39.4% reduction in phosphorus lost to water, whilst facilitating an estimated >10% reduction in agricultural emissions.

The agreement between Fawna Farms Ltd and IFS Growth Ltd is a positive step towards providing for local water quality improvement. At the catchment scale, although the proposed improvements are likely immeasurable in isolation of broad implementation of similar mitigations from other landowners and resource users, this proposal, and the collaborative approach between these two landowners sets the tone for the water quality improvement that will be required as we work towards achieving a state of hauora.

The proposal is carbon positive and provides for positive improvement in local water quality.

A decision to grant the resource consent application(s) under Section 104B is recommended on the basis that:

a) the adverse effects on the environment are highly likely to be insignificant;
b) The proposal is consistent with the requirements of the RMA, relevant regional plan objectives and policies and other relevant matters.

Granting the resource consent application(s) will be consistent with the purpose of the RMA for the reasons explained within this report. The proposed activities are highly unlikely to result in further degradation of water quality and potential adverse effects will be appropriately avoided or mitigated.

Appendix A: Farm Environmental Management Plan

Appendix B: Proposed Forestry Planting Plan

Forest: Feldwick Pastoral Ltd

Type: Plantable Area Assessment - Sale Split

Produced: 28/06/2022

(At A3)
1:10,000
0 50 100 150 200 m

Legend

Boundaries

- Titles

Title (455.5 ha)

- Plantable Block (285.5 ha)
- Other Block (170 ha)

Plantable Block (285.5 ha)

- Plantable Grassland (245.5 ha)
- Pond (0.08 ha)
- Natural Forest (22.2 ha)
- Open Space Covenant (7.4 ha)
- Setbacks (10.3 ha)

Other Block (170 ha)

- Cottage (4.1 ha)
- Dairy Farm (138.9 ha)
- Powerline Border Setback (2.9 ha)
- Open Space Covenant (24.1 ha)

Hydrology

- River/Stream
- Pond/Lake

Topography

- Contour Index 20m
- 10m Contours

Road Network

- Sealed Road
- Metalled Road
- Unmetalled Road

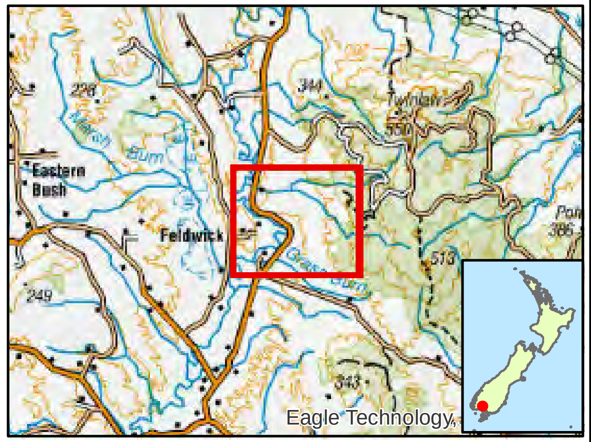
Tracks (8.9 km)*

- Vehicle Track (5.1 km)
- Secondary Track (3.8 km)

Other

- Fenceline*
- Building Outlines
- Power Line
- Power Line 30m Zone
- Protected Areas

* Field check necessary to evaluate if scrub is removable. For the Desktop Analysis the scrub has been deemed as unplantable.
* Southland & Central Otago 0.4m Rural Aerial Photos (2015-2017) used to digitise Scrub, Secondary Tracks and Fencelines. Small segments of loose secondary tracks have been added. Necessary to ground check and capture the full extent.



www.ifsgrowth.co.nz

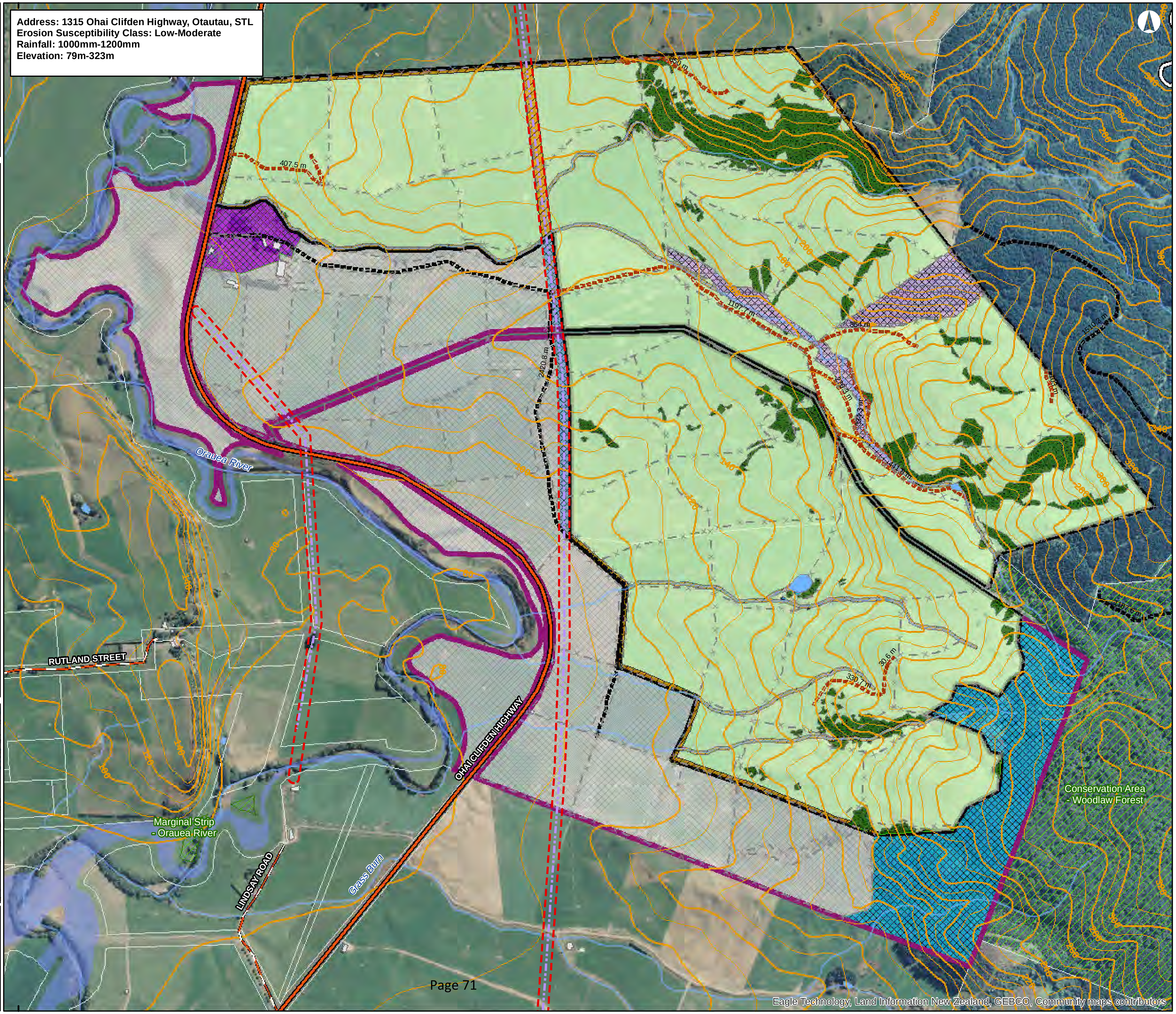
Produced: 28/06/2022

Disclaimer: This map has been derived from a combination of supplied topographic and landuse data. While all possible care has been taken ensuring the accuracy of the data, IFS Growth Ltd accepts no responsibility or liability for any errors in this mapping.

Topographic data is from the LINZ NZ Topo database.

Coordinate System: NZGD 2000 New Zealand Transverse Mercator
Projection: Transverse Mercator
Units: Meter

Address: 1315 Ohai Clifden Highway, Otautau, STL
Erosion Susceptibility Class: Low-Moderate
Rainfall: 1000mm-1200mm
Elevation: 79m-323m



Appendix C: Nutrient Budget Report

Fawna Farms Limited

OverseerFM farm system modelling to support a consent application for expanded dairy

Report prepared for:
Fawna Farms Limited
1620 Clifden Ohai Highway
Otautau 9682

Property Address:
1620 Clifden Ohai Highway
Scott's Gap
Otautau 9682

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30th September 2022

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This report is designed to be read in its entirety and any excerpts should reference the report for completeness of understanding.

Contents

1.0 Executive summary:

Fawna Farms is a 370.9 ha dairy farm and has a consent to peak milk 900 dairy cows.

A neighbouring and adjoining 454.6 ha farm has been purchased by IFS Growth – a forestry management and investment company. The IFS Growth property is currently operated as a dairy support, sheep and beef trading property.

The IFS Growth property is of flat, rolling, and easy hill topographies. An assessment has been undertaken to identify the environmental risk areas on the IFS Growth property and the best long term sustainable use of the property. From the environmental risk assessment, it is proposed that:

1. IFS Growth retire the steeper contour land from pastoral farming and establish a 288.7 ha forestry block
2. Fawna Farms purchase the remaining 165.9 ha from IFS Growth to expand their dairy farm

The proposed dairy expansion by Fawna Farms requires a land use consent for expanded dairying.

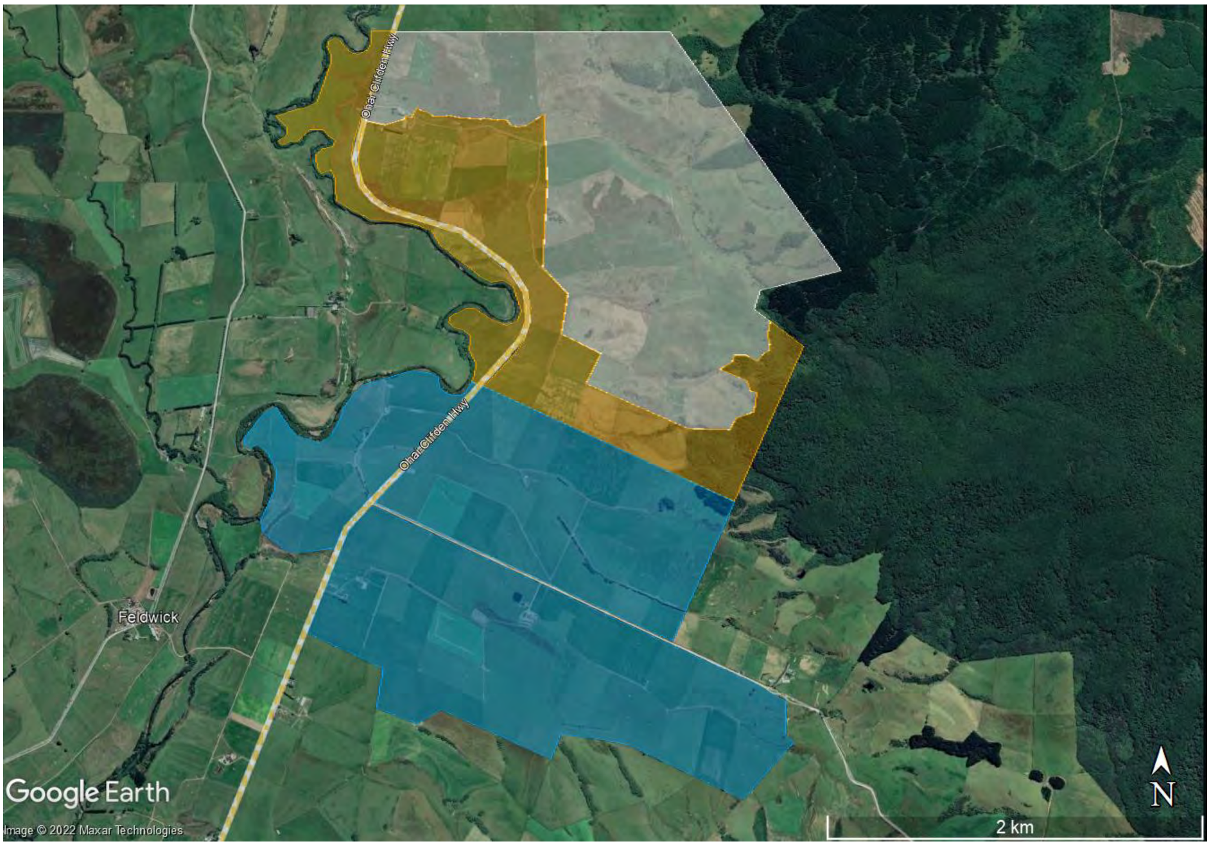


Figure 1.The map above shows the area currently owned by Fawna Farms (Blue) and IFS Growth (white and orange). It is proposed to incorporate the orange area into the Fawna Farms property and the white area will be converted into forestry by IFS Growth

The proposed Fawna Farms dairy expansion includes increasing the dairy farm by 165.9 ha (an increase from 370.9 ha to 536.8 ha) and will enable the farm to be self-contained for dairy cow wintering. It is proposed to increase the peak herd number from 900 to 1200 cows.

The proposed IFS Growth 288.7 ha forestry block will not only retire land from pastoral farming but also remove current winter cropping on the steeper and therefore higher risk portion of the property.

Current Fawna Farms

The Fawna Farms dairy farm is 370.9ha and is made up of a mix of rolling and flat topographies. The property has a current effluent discharge consent that allows a maximum of 900 cows milking. In the Year End 2020 period, under a previous owner's management, the property peak milked 870 cows producing 418,777kgMS (481kgMS/cow). Replacement calves were grazed on farm until May, and in calf heifers returned to the platform in May. In the 2019 winter, 20ha of swedes were grazed, while 21.4ha were sown for the 2020 winter. The maximum crop area grazed in the 2014 to 2019 reference period was 24.7ha. Soil tests taken in 2019 show that the Olsen P was 33.

Current IFS Growth

The property has been managed as a dairy support, sheep, and beef trading operation. At the end of the Year Ending 2020 period, under the previous owner's management, the property was running 210 dairy calves, 530 MA dairy cows, 89 Wagyu R3s, 218 Jersey and Belted Galloway mature bulls, 160 R1 dairy cross steers and heifers, and approximately 300 sheep. In the 2019 winter, 33.7ha of crop was grazed, while 29.2ha was sown for the 2020 winter. The maximum crop area grazed in the 2014 to 2019 reference period was 33.7 ha. Soil tests taken in 2018 show that the Olsen P was 32.

Proposed Fawna Farms

It is proposed that Fawna Farms Limited purchase 165.9ha of flat and rolling land of the IFS Growth property. This area would then be incorporated into the dairy platform to increase cow numbers to 1,200 at peak. Production would increase to 480,000kgMS. Young stock would be grazed off farm from weaning and will return as in calf heifers 18 months later. All cows would be wintered on farm on 53.7ha of swedes, supplemented with baleage.

Proposed IFS Growth

Of the remaining 288.7 ha owned by IFS Growth, 245.5ha will be planted in pine trees. A further 29.6ha of native bush and QE2 area would be left undisturbed.

Nutrient budgeting

Nutrient budgeting has been completed using OverseerFM version 6.4.3 to support a consent application for expanded dairy. These budgets estimate the nitrogen and phosphorus losses from the landholding in the Year Ending 2020 period and the proposed farm systems:

- Year Ending 2020
  The losses from the Year End 2020 is the sum of losses from Fawna Farms dairy farm and the IFS Growth dairy support, beef trading and sheep property.
- The proposed system
  The losses from the proposed system is the sum of the losses from the expanded Fawna Farms dairy farm and the IFS Growth forestry block.

1.1 Nutrient budgeting output summary

The tables below show the outputs from OverseerFM for modelling of the Year End 2020 and Proposed farm systems.

Table 1. Estimated nutrient losses from the Year End 2020 landuse on the Fawna Farms dairy farm and the IFS Growth mixed enterprise property as estimated by OverseerFM version 6.4.3.

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Total YE2020**
Area (ha)	370.9	454.6	825.5
Total Farm N Loss (kg)	17,607	14,099	31,706
N Loss/ha (kgN/ha/yr)	47	31	38
Total Farm P Loss (kg)	401	668	1069
P loss/ha (kgP/ha/yr)	1.1	1.5	1.3
Pasture Grown (tDM/ha)	16.1	10.4 (flat and rolling) 6.2 (easy hill)	
Total Revised Stock Units (RSU)	9,872	4,799	14,671

Table 2. Estimated nutrient losses from the proposed landuse on the Fawna Farms dairy farm and the IFS Growth forestry block as estimated by OverseerFM version 6.4.3.

	Fawna Farms Proposed Dairy Farm	**IFS Growth Proposed** Forestry	**Total Proposed**
Area (ha)	536.8	288.7	825.5
Total Farm N Loss (kg)	28,835	730	29565
N Loss/ha (kgN/ha/yr)	54	3	36
Total Farm P Loss (kg)	613	35	648
P loss/ha (kgP/ha/yr)	1.1	0.1	0.8
Pasture Grown (tDM/ha)	15.9	NA	
Total Revised Stock Units (RSU)	12,598	0	12,598

Note: Estimated pasture grown figures are higher than expected for the dairy farms. This is discussed in section 4.1

Table 3. Comparison of the estimated nutrient losses for the Year End 2020 and the proposed system as estimated by OverseerFM version 6.4.3.

	Total YE2020	Total Proposed	Estimated change
Area (ha)	825.5	825.5	
Total Farm N Loss (kg)	31,706	29,565	Reduction of 2141 kgN 6.8% decrease
N Loss/ha (kgN/ha/yr)	38	36	
Total Farm P Loss (kg)	1,069	648	Reduction of 421 kgP 39.4% decrease
P loss/ha (kgP/ha/yr)	1.3	0.8	
Total Revised Stock Units (RSU)	14,671	12,598	Reduction of 2,073 RSU 14.1% decrease

1.2 Drivers of changes in nutrient losses

1.2.1 Nitrogen loss estimates

Nitrogen losses from a farm system can have negative impacts on water quality downstream. This in turn can have negative implications on aquatic life and human health. The use of OverseerFM has estimated a 6.8% decrease in nitrogen losses between the current and proposed scenarios. This is the cumulative result of many changes to the farm system including:

Decrease in nitrogen loss risk:

- A reduction in grazed area due to conversion to forestry
- A reduction in nitrogen fertiliser use on the winter crops
- Reduction in RSU
- RSU / ha decreasing on the original dairy area
- Increase in effluent area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed

Increase in nitrogen loss risk:

- Increase in productivity of the area converted to dairy
- Increase in total nitrogen fertiliser used

1.2.2 Phosphorus loss estimates

Phosphorus losses from farms can cause algal growth in surface waterways. The use of OverseerFM has estimated a 39.4% decrease in Phosphorus losses in the proposed system. This is the cumulative result of many changes to the farm system including:

- A reduction in grazed area due to conversion to forestry. This results in less soil disturbance by hooves and greater vegetative cover which will slow down water as it runs off land
- Decrease in Phosphorus fertiliser use
- Decrease in RSU
- Removal of sheep and beef and third-party dairy grazing operation
- Fencing off streams

2.0 Report purpose

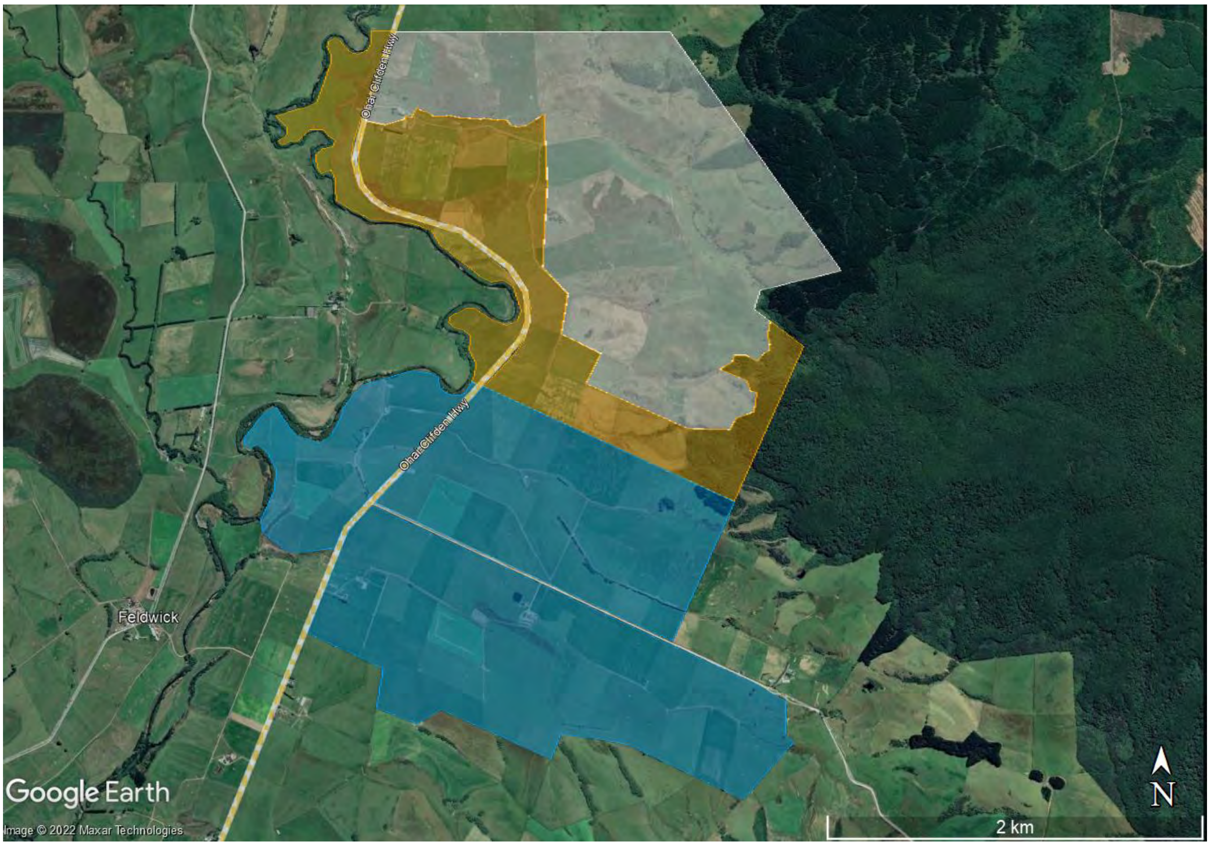
The results of the budgets will be utilised to support a land use consent application for expanded dairying. This report will emphasise the relevant requirements in the proposed Southland Water and Land Plan, and the National Environmental Standards from a nutrient budgeting perspective. The broader range of requirements should be captured in the Farm Environmental Management Plan (FEMP). This report will inform the FEMP which will be completed separately.
Potential environmental risks on the property have been considered and should be included in the FEMP. These include:

- Contamination of ground water
- Contamination of surface water
- Undesired changes in soil nutrient status
- Nutrient application to non-target land
- Accumulation of non-nutrient impurities in the soil profile
- Excess stocking rate
- Pugging and compaction
- Poor cultivation methods

3.0 Farm overview

3.1 Landholding location and ownership

The landholding is located at Feldwick, northwest of Otautau and south of Ohai. It is owned in two separate properties by Fawna Farms and IFS Growth. The map below shows the area currently owned by Fawna Farms (blue) and IFS Growth (white and orange). It is proposed to incorporate the orange area into the Fawna Farms property and the white area will be converted into forestry by IFS Growth.



3.2 Landholding particulars:

	Fawna Farms Limited
Property Addresses	Fawna Farms Limited 1620 Clifden Ohai Highway Scott's Gap Otautau 9682 IFS Growth Limited 1315 Ohai Clifden Highway Feldwick Otautau 9682
Legal Description	Fawna Farms Limited • Section 16 and 18 Merrivale Settlement No 2

	• Section 94 and part sections 29 and 94R Block IX Waiau Survey District • Section 1 Survey Office Plan 452868 • Lot 3 Deposited Plan 340527 IFS Growth Limited • Lot 1-7 Deposited Plan 7360 • Section 250 Block IX Waiau Survey District Please note: a subdivision consent application is occurring alongside the dairy expansion consent application. At the time of writing, the land being sold to Fawna Farms did not have a title.
Area	**Current:** Fawna Farms Limited: 370.9ha IFS Growth Limited 454.6ha Total landholding 825.5ha **Proposed (following subdivision):** Fawna Farms Limited: 536.8ha IFS Growth Limited: 288.7ha Total landholding: 825.5ha

3.4 Farm system overview

A detailed description of the modelling methodology and Overseer input data is given in the appendices of this report. This section gives an overview of the farm system modelled in each budget.

3.4.1 Fawna Farms YE20

A nutrient budget was completed for the Year Ending 2020. As Fawna Farms did not own the property in the YE20 period, the information was collected from the previous owners. The information is of a good standard. Where possible the information collected has been verified against Google Earth and the previous owners purchase/sale records.

Stock and production:

- 870 Friesian Jersey cross cows were milked at peak
- Production of 418,777kgMS (481kgMS/cow)
- 230 dairy calves were reared on farm and grazed on farm until the 1st May.
- 220 In calf heifers returned from the runoff on the 1st May and were wintered on farm

Feed

- Imported feed was:
  - PKE – 258.2t fed in shed
  - DDG – 264.8t fed in shed
  - Baleage – 132tDM fed to dairy cows

- Winter crop sown:
  - 2019 winter – 20.0ha of swedes
  - 2020 winter - 21.4ha of swedes

Fertiliser

- Soil tests were taken in June 2019. These showed good soil fertility levels across the property. The Olsen P was 33.
- Fertiliser purchase records have been used to enter actual fertiliser use into Overseer.
- Pastoral nitrogen fertiliser use was 219kgN/ha applied in split dressings from August to April.

Structures

- Dairy effluent was separated using a weeping wall. Liquids were applied using a travelling irrigator to 67.1ha of the hydranted effluent area. Solids were applied to paddocks across the entire platform when conditions were favourable.

3.4.2 IFS Growth YE20

A nutrient budget was completed for the Year Ending 2020. As IFS Growth did not own the property in the YE20 period, the information was collected from the previous owners. The information is of a fair standard. Where possible the information collected has been verified against Google Earth and the previous owners purchase/sale records. Where detailed information was not available, conservative assumptions have been made using industry standards.

Stock and production:

The property was operated as a mixed dairy support, beef trading and sheep breeding/finishing farm. A full description of the stock classes and stock numbers is given in the appendices of this report. Year-end 2020 stock numbers on farm were:

- Dairy Support
  - 210 dairy R1 heifers
  - 530 MA dairy cows
- Beef Trading
  - 89 Wagyu R3s
  - 218 Jersey and Belted Galloway mature bulls
  - 160 R1 dairy cross steers and heifers
- Sheep
  - 250 hoggets
  - 40 lambs
  - 35 ewes

Feed

- No imported feed
- Winter crop sown:

- 2019 winter – 33.7ha of swedes and fodder beet
- 2020 winter – 29.2ha of swedes and fodder beet

Fertiliser

- Soil tests were taken in August 2018. These showed good soil fertility levels across the property. The Olsen P was 32.
- Fertiliser purchase records have been used to enter actual fertiliser use into Overseer.
- Pastoral nitrogen fertiliser use was 17kgN/ha on the flat and rolling areas, and 6kg/ha on the Easy Hill area.

3.4.3 Fawna Farms Proposed Dairy System

Fawna Farms propose to operate a lower input, lower per cow production system than that operated in the YE20 by the previous owners which is consistent with how they have historically operated other properties. The expansion of the dairy farm will allow the farm to milk 1200 cows at peak, winter all cows on farm and grow a significant proportion of their winter baleage requirements.

Following the expansion of the dairy platform, Fawna Farms will operate the following system:

Stock and production:

- 1200 Friesian Jersey cross cows milked at peak
- Production of 480,000kgMS (400kgMS/cow)
- 300 dairy calves will be reared on farm. They will be grazed off farm from the 1st Dec
- 285 Incalf heifers will return to the platform on the 1st May
- All cows will be wintered on farm

Feed

- Imported feed is expected to be:
  - PKE – 150TDM fed in shed
  - DDG – 150TDM fed in shed
- Winter crop sown:
  - 53.7ha of Swedes

Fertiliser

- Soil fertility will decrease slightly to a 32 Olsen P. This Olsen P is slightly above the agronomic optimum to support the high pasture growth required within the system.
- Maintenance fertiliser rates have been entered into Overseer.
- Pastoral nitrogen fertiliser will be 189kgN/ha applied in split dressings from August to April.

Structures

- Dairy effluent will continue to be separated using a weeping wall. The liquid effluent application area will be increased to cover the entire hydranted area of 176.2ha. Solids will be applied to paddocks across the entire platform when conditions are favourable.

3.4.4 IFS Growth Forestry Block

All stock will be removed from the IFS Growth property. Pine trees will be planted on approximately 245.5ha of the property. A further 29.6ha of native bush and QE2 area will be left undisturbed.

Please Note:

For the YE20 budgets, baleage and silage supplements have been distributed to enterprise without time of year specified. This is because distributing the supplements to a block (crops and pastoral) resulted in an error message. This error is believed to be a result of Overseer underestimating the feed requirements and overestimating the feed utilisation in Southland crop wintering scenarios. To ensure an "apples with apples" approach, baleage and silage in the proposed dairy farm nutrient budget has also been distributed to enterprise without time of year specified.

4.0 OverseerFM nutrient loss estimates

The tables below show the outputs from OverseerFM for modelling of the Year End 2020 and Proposed farm systems.

Table 4. Estimated nutrient losses from the Year End 2020 landuse on the Fawna Farms dairy farm and the IFS Growth mixed enterprise property as estimated by OverseerFM version 6.4.3.

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Total YE2020**
Area (ha)	370.9	454.6	825.5
Total Farm N Loss (kg)	17,607	14,099	31,706
N Loss/ha (kgN/ha/yr)	47	31	38
Total Farm P Loss (kg)	401	668	1069
P loss/ha (kgP/ha/yr)	1.1	1.5	1.3
Pasture Grown (tDM/ha)	16.1	10.4 (flat and rolling) 6.2 (easy hill)	
Total Revised Stock Units (RSU)	9,872	4,799	14,671

Table 5. Estimated nutrient losses from the proposed landuse on the Fawna Farms dairy farm and the IFS Growth forestry block as estimated by OverseerFM version 6.4.3.

	Fawna Farms Proposed Dairy Farm	**IFS Growth Proposed** Forestry	**Total Proposed**
Area (ha)	536.8	288.7	825.5
Total Farm N Loss (kg)	28,835	730	29565
N Loss/ha (kgN/ha/yr)	54	3	36
Total Farm P Loss (kg)	613	35	648
P loss/ha (kgP/ha/yr)	1.1	0.1	0.8
Pasture Grown (tDM/ha)	15.9	NA	
Total Revised Stock Units (RSU)	12,598	0	12,598

Note: Estimated pasture grown figures are higher than expected for the dairy farms. This is discussed in section 4.1

Table 6. Comparison of the estimated nutrient losses for the Year End 2020 and the proposed system as estimated by OverseerFM version 6.4.3.

	Total YE2020	Total Proposed	Estimated change
Area (ha)	825.5	825.5	
Total Farm N Loss (kg)	31,706	29565	Reduction of 2141 kgN 6.8% decrease
N Loss/ha (kgN/ha/yr)	38	36	
Total Farm P Loss (kg)	1069	648	Reduction of 421 kgP 39.4% decrease
P loss/ha (kgP/ha/yr)	1.3	0.8	
Total Revised Stock Units (RSU)	14,671	12,598	Reduction of 2,073 RSU 14.1% decrease

4.1 Notes for interpretation of OverseerFM outputs

Estimated pasture grown

It should be noted that the estimated pasture grown outputs from Overseer are higher than expected for the dairy scenarios. Overseer uses a default value for ryegrass/white clover pasture quality irrespective of the land use and management. The default Overseer value in Southland ranges from 10.5 to 11.17 MJ ME/ kg DM depending on the month (reference: Characteristics of pasture, June 2018, D M Wheeler AgResearch Ltd). Pasture cuts from an Eastern Southland monitor farm show MEs of 11.5 to 12.2 (reference: Pasture growth and quality on Southland and Otago dairy farms, D. E. Dalley and T. Geddes, DairyNZ, NZ Grasslands Publication 2012).

The Overseer default values have been used throughout the entirety of this modelling as the Best Practice Data Input Standards state that "*there needs to be a very good long-term average evidence of clover content, pasture utilisation, pasture N content and pasture quality to justify changes from the default OVERSEER values. This level of information would be rare.*"

To ensure that comparisons are valid between the baseline and proposed the same method has been used to ensure that an "apples with apples" approach is taken.

Regarding the area that will be added to the Fawna Farms dairy platform, it is estimated that this area will achieve similar pasture production to the current dairy farm area. This is due to a change in farm system (sheep, dairy grazing and beef trading to dairy) and a result of factors such as re-grassing, rotational grazing and higher nitrogen fertiliser use. This also has a corresponding increase in biological fixation.

5.0 Conclusions

Modelling of the Year End 2020 landuse has been compared to the proposed landuse going forward using OverseerFM version 6.4.3. The modelling has estimated that the proposed system will have 6.8% lower losses of nitrogen and 39.4% lower losses of phosphorus.

5.1 Drivers of changes in nutrient losses

5.1.1 Nitrogen loss estimates

Nitrogen losses from a farm system can have negative impacts on water quality downstream. This in turn can have negative implications on aquatic life and human health. The use of OverseerFM has estimated a 6.8% decrease in nitrogen losses between the current and proposed scenarios. This is the cumulative result of many changes to the farm system including:

Decrease in nitrogen loss risk:

- A reduction in grazed area due to conversion to forestry
- A reduction in nitrogen fertiliser use on the winter crops
- Reduction in RSU
- RSU / ha decreasing on the original dairy area
- Increase in effluent area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed

Increase in nitrogen loss risk:

- Increase in productivity of the area converted to dairy
- Increase in total nitrogen fertiliser used

5.1.2 Phosphorus loss estimates

Phosphorus losses from farms can cause algal growth in surface waterways. The use of OverseerFM has estimated a 39.4% decrease in Phosphorus losses in the proposed system. This is the cumulative result of many changes to the farm system including:

- A reduction in grazed area due to conversion to forestry. This results in less soil disturbance by hooves and greater vegetative cover which will slow down water as it runs off land
- Decrease in Phosphorus fertiliser use
- Decrease in RSU
- Removal of sheep and beef and third party dairy grazing operation
- Fencing off streams

5.2 Recommendations from here

OverseerFM can model a specific range of good management practices. Below is a summary of the potential environmental risks on this property and gives recommendations to mitigate these risks.

Good practice for fertiliser use:

- Regular soil testing is used to inform fertiliser recommendations that target agronomic optimum P, K, S, Mg and Ca levels.
- Develop a fertiliser plan with your fertiliser representative. Recommend you make this OverseerFM modelling available to your fertiliser representative to assist them in developing the fertiliser recommendations.
- Apply using a Spreadmark accredited company for fertiliser application – apply at correct rate and with a buffer to waterways.
- Use of Fertmark registered products.
- Record fertiliser applications (location, date of application and amount applied).

Nitrogen:

- Apply nitrogen strategically to meet plant demand.
- Applications should generally be avoided in May due to rapidly declining growth rates.
- Spring nitrogen applications should not be on soil less than 7 degrees Celsius.

Phosphorus:

- OverseerFM is not spatially explicit and a phosphorus mitigation plan should be developed to reduce phosphorus losses.

Critical source areas:

- These include laneways, gateways, swales in paddocks and wallows.
- Review your Farm Environmental Management Plan to update as required and take action on mitigating risk on any new critical source areas identified.

The Proposed Water and Land Plan is currently in the appeals process and is partially operative. It will be important to stay up to date with developments in Environment Southland policy and rules, including the limit setting process which will develop over the next few years.

A National Environmental Standard (NES) has been gazetted. This has implications for the wintering of stock on crop, stock exclusion from waterways, nitrogen fertiliser use, changes in landuse and the use of stockholding areas for cattle.

Both the Proposed Water and Land Plan and the National Environmental Standards require a farm of this size to have a farm environmental management plan. This should be updated to include the recommendations within this report.

Appendices

Appendix 1. Modelling Methodology

Nutrient losses have been estimated using the OverseerFM Version 6.4.3 model. OverseerFM is a software application that models nutrient movements within a farm system. Input data detailing the farm system is entered into the software and interpreted through the use of a series of sub-model that calculate the flow of seven major farm nutrients (Nitrogen, Phosphorus, Sulphur, Calcium, Magnesium and Sodium). Output data is reported for interpretation and to inform farm management practices. It currently requires an expert user to describe the physical and management details of a farm.

OverseerFM assumptions

Within the OverseerFM software, assumptions have been made of the farm management:

- Long term annual average model
  The model uses annual average input and produces annual average outputs.
- Near equilibrium conditions
  Model assumes that that the farm is at a state where there is minimal change each year.
- Actual and reasonable inputs
  It is assumed that input data is reasonable and a reflection of the actual farm system. If any parameter changes, it is assumed that all other parameters affected will also be changed.
- Good management practices are followed
  OverseerFM assumes the property is managed at industry agreed good management practice for a specific list of factors including effluent and fertiliser applications. OverseerFM does not assume that all industry agreed good management practices are undertaken on farm.

OverseerFM limitations

Key limitations of the OverseerFM model are:

- OverseerFM does not predict transformations, attenuation or dilution of nutrients between the root zone or farm boundary and the eventual receiving water body. A catchment model is needed to estimate the effects of the nutrient losses from farms on groundwater, river or lake water quality.
- OverseerFM does not calculate outcomes from extreme events (floods and droughts) but provides a typical years result based on a long-term average.
- OverseerFM does not calculate the impacts of a conversion process, rather it predicts the long-term annual average nutrient budgets for changed land use.
- OverseerFM is not spatially explicit beyond the level of defined blocks.
- Not all management practices or activities that have an impact on nutrient losses are captured in the OverseerFM model.
- OverseerFM does not represent all farm systems in New Zealand.
- Components of OverseerFM have not been calibrated against measured data from every combination of farm systems and environment.

Information on OverseerFM can be obtained from the following reports:

- Technical Description of OVERSEER for Regional Councils, September 2015
- Review of the phosphorus loss submodel in OVERSEER®, September 2016
- Using OVERSEER® in Regulation – Technical Resources and Guidance for Regional Councils, August 2016

Data input standards

Nutrient budgets have been constructed using the OverseerFM Version 6.4.3 model.

The nutrient budgets have been developed in accordance with the Overseer data input protocols - "Overseer, Best Practice Data Input Standards, March 2018" and the "OverseerFM User Guide, October 2019." No deviations have been made from these protocols.

Appendix 2. Modelling Inputs

Soil types

Soil type has a large bearing on nutrient loss levels from a property. This is due to different soil types having different water holding capacities, and drainage characteristics. It is therefore important that soil type is inputted correctly.

The table below gives a brief description of the soil types found on the landholding:

S-map ref	Soil Order and Group	Drainage class	Description
Auchr_9b.1	Pallic, Recent/YGE/BGE	Poor	deep, poorly drained, clay
Hedge_4a.1	Brown, Sedimentary	Moderately well	deep, moderately well drained, silt
Malok_3a.1	Melanic, Sedimentary	Well	deep, well drained, silt over clay
Apar_6a.1	Brown, Sedimentary	Imperfect	deep, imperfectly drained, silt
Eure_22a.1	Gley, Sedimentary	Poor	deep, poorly drained, silt
Tuap_6b.2	Melanic, Sedimentary	Well	deep, well drained, silt
Waiau_3a.1	Recent, Recent/YGE/BGE	Well	shallow, well drained, sand
Makar_3b.1	Gley, Sedimentary	Poor	deep, poorly drained, clay
Ihak_23a.1	Brown, Sedimentary	Moderately well	deep, moderately well drained, silt over clay

The table below shows the area of the block that the soils identified cover:

S-map ref/name	Total area
Auchr_9b.1	376.3 ha
Hedge_4a.1	174.2 ha
Apar_6a.1	66.6 ha
Malok_3a.1	66.2 ha
Eure_22a.1	20.1 ha
Tuap_6b.2	19.6 ha
Waiau_3a.1	11.6 ha
Makar_3b.1	11.4 ha
Ihak_23a.1	10.9ha

Climate Data

The following climate information has been estimated by the OverseerFM climate station tool:

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Fawna Farms Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
Annual Rainfall (mm)	958-970	958-990	958-977	965-978
Mean Annual Temp (°C)	10.1 – 10.4	9.6-10.4	9.6-10.3	9.6-10.1
Annual PET (mm)	673-693	647-690	647-688	650-676

Blocks

The farms have been split into the following pastoral, riparian and fodder crop blocks based on soil type, contour, drainage and land use.

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Fawna Farms Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
	Area (ha)			
Pasture blocks				
Non Effluent - Flat	143.4		71.9	
Non Effluent - Rolling	70.5		57.9	
West of Road - Flat	49.9		59.3	
Fawna Farms - Flat		90.9	114.9	
Fawna Farms – Rolling		26.0	26.0	
IFS Growth – Easy Hill		75.9		
IFS Growth – Flat		20.1		
IFS Growth - Rolling		128.7		
Effluent - Flat	67.1		156.6	
Effluent - Rolling			19.6	
Crop blocks				
Swedes ('19 and '20) west of road	7.0			
Swedes ('19) non effluent flat	6.0			
Swedes ('19) non effluent rolling	7.0			
Swedes ('20) non effluent flat	12.0			
Swedes ('20) west of road	2.4			
FB ' 20 (Fawna flat)		4.1		
FB '19 (Fawna flat)		9.3		
FB '19 (IFS rolling)		7.0		
FB '19 - FB '20 (Fawna flats)		5.7		
FB '19 - swede '20 (Fawna flat)		0.4		
FB '19 - swede '20 (IFS flat)		6.8		
FB '20 (IFS flat)		12.2		
Swedes '19 (Fawna flat)		4.5		
Forestry				
Pine planting				245.5
Productive Block Area	**365.3**	**391.6**	**506.2**	**245.5**
QE2 covenant area		31.5	24.1	7.4
Native Bush		22.2		22.2
Setbacks				5.2
Non-effective area	5.6	9.3	6.5	8.4
Total area	**370.9**	**454.6**	**536.8**	**288.7**
Rotating fodder crops				
Swedes			53.7	

Pasture & Crops

	Fawna Farms **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
Drainage	50% drained by mole/tiles	Flats and Rolling blocks 50% drained by tiles/moles	50% drained by mole/tiles	NA
Pasture Distribution	No difference between blocks	Easy Hill blocks have 60% of the pasture yield of the flat/rolling blocks	No difference between blocks	NA
Crops	2019 = 20ha swedes 2020 = 21.4ha swedes <u>Swedes</u> Sown in December (conventional cultivation) Yield 12TDM/ha Grazed June – Sep by dairy cows and replacements 220kg/ha DAP at sowing 100kg/ha Sustain Feb	2019 = 33.7ha 2020 = 29.2ha <u>Fodder Beet</u> Sown in December (conventional cultivation) Yield 20TDM/ha Grazed from Jun – Sep by beef and dairy grazing stock 417kg/ha Fodder beet base at sowing 169kg/ha sustain in Feb <u>Swedes</u> Sown in December (conventional cultivation) Yield 12TDM/ha Grazed June – Sep by beef and dairy grazing stock 417kg/ha Fodder Beet Base at sowing 169kg/ha Sustain in Feb Paddocks that were resown in pasture following the 2019 winter were fertilised with 174kg/ha DAP at sowing.	<u>Swedes</u> 53.7ha rotating through the entire farm Sown in December (Conventional Cultivation) Yield 12tDM/ha Grazed in May by replacements Grazed in June – August by MA cows and replacements 250kg/ha DAP at sowing 100kg/ha Urea in Feb	NA

Animals

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
Milk solids production	418,777 kgMS (481kg/cow) Median calving date – 25 Aug Drying off – 26 May	None	480,000 kgMS (400kgMS/cow – note change in farm ownership and farm system compared to the YE2020) Median calving date – 25 Aug Drying off – 26 May	NA
Dairy cows on farm	Breed FJx July 320 Aug 900 Sept 885 Oct 870 Nov 870 Dec 870 Jan 870 Feb 870 March 850 April 810 May 680 June 50 18 breeding bulls (2yr old jersey) – 20th Oct – 1st Feb	Breed FJx July 530 Aug 530 (until 7th) June 530	Breed FJx July 1240 Aug 1240 Sept 1220 Oct 1200 Nov 1200 Dec 1200 Jan 1200 Feb 1200 March 1172 April 1117 May 1060 June 955 25 breeding bulls (2yr old jersey) – 20th Oct – 1st Feb	NA

<table>
<tr><th>Description</th><th>Fawna Farms
YE2020
Dairy Farm</th><th>IFS Growth
YE2020
Mixed Enterprise</th><th>Fawna Farms
Proposed
Dairy Farm</th><th>IFS Growth
Proposed
Forestry</th></tr>
<tr><td>Dairy replacements</td><td>230 replacements on until May 1st

Incalf R2s return 1st May (220)</td><td>FJx dairy replacements

<table>
<tr><th></th><th>Calves</th><th>Heifers</th></tr>
<tr><td>Jul</td><td></td><td>165</td></tr>
<tr><td>Aug</td><td></td><td>165</td></tr>
<tr><td>Sep</td><td></td><td>165</td></tr>
<tr><td>Oct</td><td></td><td>165</td></tr>
<tr><td>Nov</td><td></td><td>165</td></tr>
<tr><td>Dec</td><td></td><td>165</td></tr>
<tr><td>Jan</td><td>210</td><td>165</td></tr>
<tr><td>Feb</td><td>210</td><td>140</td></tr>
<tr><td>Mar</td><td>210</td><td>140</td></tr>
<tr><td>Apr</td><td>210</td><td>140</td></tr>
<tr><td>May</td><td>210</td><td>140</td></tr>
<tr><td>Jun</td><td>210</td><td></td></tr>
</table></td><td>300 raised – leave on 1st Dec

285 incalf heifers return 1st May</td><td>NA</td></tr>
<tr><td>Beef</td><td>30 beef cross calves reared. 20 sold 1st Dec, rest taken through to Feb as R2s</td><td>Beef Trading stock were run on the property

Stock had access to streams

<table>
<tr><th></th><th>R2 Wagyu Steers</th><th>R2 Jersey Sire Bulls</th><th>R2 Belted Galloway Bulls</th><th>R3 Jersey Sire Bulls</th><th>R3 Belted Galloway Bulls</th></tr>
<tr><td>Jul</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
<tr><td>Aug</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
<tr><td>Sep</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
<tr><td>Oct</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
</table></td><td>None</td><td>NA</td></tr>
</table>

<table>
<tr><th>Description</th><th>Fawna Farms
YE2020
Dairy Farm</th><th>IFS Growth
YE2020
Mixed Enterprise</th><th>Fawna Farms
Proposed
Dairy Farm</th><th>IFS Growth
Proposed
Forestry</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Nov</td><td>89</td><td>30</td><td></td><td></td><td>40</td></tr>
<tr><td>Dec</td><td>89</td><td>30</td><td>40</td><td></td><td></td></tr>
<tr><td>Jan</td><td>89</td><td>30</td><td>40</td><td></td><td></td></tr>
<tr><td>Feb</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>Mar</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>Apr</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>May</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>Jun</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Dairy Cross Beef</td><td></td><td>Dairy Cross stock were reared and grazed on farm as a trading line
<table>
<tr><th></th><th>Dairy Cross steer calves</th><th>Dairy Cross heifer calves</th></tr>
<tr><td>Jul</td><td></td><td></td></tr>
<tr><td>Aug</td><td>30</td><td>15</td></tr>
<tr><td>Sep</td><td>30</td><td>15</td></tr>
<tr><td>Oct</td><td>30</td><td>15</td></tr>
<tr><td>Nov</td><td>30</td><td>15</td></tr>
<tr><td>Dec</td><td>130</td><td>30</td></tr>
<tr><td>Jan</td><td>130</td><td>30</td></tr>
<tr><td>Feb</td><td>130</td><td>30</td></tr>
<tr><td>Mar</td><td>130</td><td>30</td></tr>
<tr><td>Apr</td><td>130</td><td>30</td></tr>
<tr><td>May</td><td>130</td><td>30</td></tr>
<tr><td>Jun</td><td>130</td><td>30</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

<table>
<tr><th>Description</th><th>Fawna Farms
YE2020
Dairy Farm</th><th>IFS Growth
YE2020
Mixed Enterprise</th><th>Fawna Farms
Proposed
Dairy Farm</th><th>IFS Growth
Proposed
Forestry</th></tr>
<tr><td>Sheep</td><td>None</td><td>In the Year Ending 2020, sheep were sold with the intention of increasing the beef trading occurring on farm.

Breed: Texel
Birth Rate: 140%
<table>
<tr><th></th><th>MA Ewes</th><th>Hoggets</th><th>Lambs (1050 weaned)</th></tr>
<tr><td>Jul</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Aug</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Sep</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Oct</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Nov</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Dec</td><td>750</td><td>250</td><td>710</td></tr>
<tr><td>Jan</td><td>750</td><td>250</td><td>370</td></tr>
<tr><td>Feb</td><td>750</td><td>250</td><td>40</td></tr>
<tr><td>Mar</td><td>35</td><td>250</td><td>40</td></tr>
<tr><td>Apr</td><td>35</td><td>250</td><td>40</td></tr>
<tr><td>May</td><td>35</td><td>250</td><td>40</td></tr>
<tr><td>Jun</td><td>35</td><td>250</td><td>40</td></tr>
</table>
Greasy wool weight 2625kg

Note: lamb weaning weight and detailed sale records were not available. Industry standard weaning weight has been assumed with lambs leaving the property over Dec, Jan and Feb as described by the farmer.</td><td>None</td><td>NA</td></tr>
</table>

Effluent And Structure

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
In shed feeding	Yes	NA	Yes	NA
Structures	None	NA	None	NA
Farm dairy effluent	Applied to Effluent area (67.1ha) 12-24mm, travelling irrigator Holding pond Solids separated	NA	Applied to Effluent area (176.2ha) 12-24mm, travelling irrigator Holding pond Solids separated	NA
Solid Effluent applications	Applied to pastoral area in December	NA	Applied to pastoral area in December	NA

Supplements

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
Supplements imported	264.8t DDG fed in shed 258.2t PKE fed in shed 132TDM Baleage fed to dairy	None	150TDM DDG fed in shed 150TDM PKE fed in shed	NA
Supplements harvested	144TDM Baleage harvested across entire farm – Fed to Dairy	288TDM baleage harvested on Flat and Rolling Blocks – Fed to dairy grazing and beef	450TDM baleage harvested across entire farm – fed to dairy	NA

Description	**Fawna Farms YE2020** Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Fawna Farms Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
	80TDM silage harvested across entire farm – Fed to dairy			

Fertiliser

Description	**Fawna Farms YE2020** Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Fawna Farms Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
Soil tests	As per 2019 test results Olsen P 33	As per 2018 test results (most recent) Olsen P 32	Olsen P of 32	NA
Maintenance Fert	Fertiliser purchase records have been used to enter actual fertiliser use into Overseer Fertiliser applied was above maintenance requirements.	Fertiliser purchase records have been used to enter actual fertiliser use into Overseer Fertiliser applied was below the maintenance requirements	Maintenance fertiliser applied as per Overseer recommendations	NA
Nitrogen	219kgN/ha on pastoral area applied in split applications from August to April	17kgN/ha on the flat and rolling pastoral blocks 6kg/ha on the easy hill pastoral block	189kg/ha N on pastoral area applied in split applications from August to April	NA

Appendix 3: OverseerFM Data Outputs

Fawna Farms YE2020 (Dairy Farm)

Farm nutrient budget

	Total loss (kg/yr)		**Loss per ha (kg/yr)**				
Nitrogen	17,607		47				
Phosphorus	401		1.1				
Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	208	46	52	60	98	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	40	10	20	5	12	6	5
Rain/clover fixation	80	0	2	5	3	6	28
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	47	1.1	19	90	91	5	15
As product	82	14	19	5	19	2	5
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	93	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	118	11	3	-21	1	1	0
Standing plant material	-16	-2	-13	-3	-10	-2	-2
Inorganic mineral	0	3	-15	0	-2	-3	-4
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	4	29	61	0	13	10	17
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	1	0	0	0	0	0	0

Nitrogen summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Effluent flat (67.1ha)	2647	39.8	11	314	274	219	0	95	18	15
Non effluent flat (71.9ha)	3238	45.2	11	226	225	219	0	7	20	18
Non effluent flat (89.5ha)	2431	34.4	9	226	214	219	0	7	20	14
Non effluent rolling (19.6ha)	432	34.2	10	226	213	219	0	7	3	2
Non effluent rolling (57.9ha)	3136	54.4	13	226	232	219	0	7	16	18
West of road flat (59.3ha)	1950	39.3	11	226	214	219	0	7	14	11
Swedes ('19 and '20) west of road	1003	143.4	30	85	2	85	0	0	2	6
Swedes ('19) non effluent flat	628	105.1	26	175	34	175	0	0	2	4
Swedes ('19) non effluent rolling	718	102.6	25	175	33	175	0	0	2	4
Swedes ('20) non effluent flat	591	49.5	12	138	130	138	0	0	3	3
Swedes ('20) west of road	136	56.5	14	138	130	138	0	0	1	1

Phosphorus summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Effluent flat (67.1ha)	16	0.2	46	0	5
Non effluent flat (71.9ha)	39	0.5	46	0	4
Non effluent flat (89.5ha)	18	0.2	46	0	4
Non effluent rolling (19.6ha)	7	0.5	46	0	4
Non effluent rolling (57.9ha)	120	2	46	0	4
West of road flat (59.3ha)	17	0.3	46	0	4
Swedes ('19 and '20) west of road	4	0.5	44	0	0
Swedes ('19) non effluent flat	1	0.2	70	0	0
Swedes ('19) non effluent rolling	1	0.2	70	0	0
Swedes ('20) non effluent flat	3	0.2	44	0	0
Swedes ('20) west of road	1	0.3	44	0	0

IFS Growth YE2020 (Mixed Enterprise)

Farm Nutrient Budget

	Total loss (kg/yr)			Loss per ha (kg/yr)			
Nitrogen	14,099			31			
Phosphorus	668			1.5			
Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	20	16	3	16	17	0	3
Irrigation	0	0	0	0	0	0	0
Supplements	0	0	0	0	0	0	0
Rain/clover fixation	59	0	2	5	3	6	28
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	31	1.5	22	45	85	5	23
As product	4	1	0	1	2	0	0
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	33	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	17	9	2	-22	0	0	0
Standing plant material	-7	-1	-10	-2	-7	-1	-5
Inorganic mineral	0	1	-17	0	-2	-3	-3
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	3	5	8	0	-59	5	16
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	-2	0	0	0	0	0	0

Nitrogen summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Fawna farms - flat (114.9ha)	1673	18.7	4	17	87	17	0	0	20	12
Fawna farms - rolling (26ha)	492	19	4	17	89	17	0	0	6	3
Ifs growth - easy hill (75.9ha)	994	13	-	6	59	6	0	0	17	7
Ifs growth - flat pasture (39.1ha)	379	19	4	17	88	17	0	0	5	3
Ifs growth - rolling pasture (135.7ha)	2431	18.7	4	17	88	17	0	0	29	17
Fb ' 20 (fawna flat)	374	90.9	19	117	159	117	0	0	1	3
Fb '19 (fawna flat)	1672	179.2	33	47	37	47	0	0	2	12
Fb '19 (ifs rolling)	1109	158.5	28	47	43	47	0	0	2	8
Fb '19 - fb '20 (fawna flats)	1120	197.4	36	117	111	117	0	0	1	8
Fb '19 - swede '20 (fawna flat)	91	214.9	38	105	102	105.3	0	0	0	1
Fb '19 - swede '20 (ifs flat)	1725	254	44	117	108	117	0	0	2	12
Fb '20 (ifs flat)	1189	97	20	117	157	117	0	0	3	8
Swedes '19 (fawna flat)	611	135.2	25	47	44	47	0	0	1	4
Fawna - qe2 block	72	3	-	0	0	0	0	0	5	1
Ifs growth - native bush	67	3	-	0	0	0	0	0	5	0
Ifs growth - qe2	22	3	-	0	0	0	0	0	2	0

Phosphorus summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Fawna farms - flat (114.9ha)	67	0.8	15	0	0
Fawna farms - rolling (26ha)	60	2.3	15	0	0
Ifs growth - easy hill (75.9ha)	126	1.7	15	0	0
Ifs growth - flat pasture (39.1ha)	16	0.8	15	0	0
Ifs growth - rolling pasture (135.7ha)	271	2.1	15	0	0
Fb ' 20 (fawna flat)	4	1.2	32	0	0
Fb '19 (fawna flat)	11	1.2	50	0	0
Fb '19 (ifs rolling)	8	1.2	50	0	0
Fb '19 - fb '20 (fawna flats)	8	1.4	32	0	0
Fb '19 - swede '20 (fawna flat)	0	1.4	28.8	0	0
Fb '19 - swede '20 (ifs flat)	11	1.6	32	0	0
Fb '20 (ifs flat)	16	1.3	32	0	0
Swedes '19 (fawna flat)	5	1.2	50	0	0
Fawna - qe2 block	2	0.1	0	0	0
Ifs growth - native bush	2	0.1	0	0	0
Ifs growth - qe2	1	0.1	0	0	0

Fawna Farms Proposed (Dairy Farm)

Farm nutrient budget

	Total loss (kg/yr)	**Loss per ha (kg/yr)**
Nitrogen	28,835	54
Phosphorus	613	1.1

Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	168	28	20	19	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	16	4	6	2	4	2	2
Rain/clover fixation	93	0	2	5	3	6	28
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	54	1.1	16	41	94	5	17
As product	64	11	15	4	15	1	4
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	89	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	64	12	3	-19	1	0	0
Standing plant material	-16	-2	-15	-1	-2	-1	-1
Inorganic mineral	0	2	-23	0	-2	-3	-4
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	16	7	33	0	-99	6	13
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	7	1	0	1	0	0	0

Nitrogen summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Effluent flat (67.1ha)	1918	31.8	9	244	227	189	0	56	13	7
Effluent flat (89.5ha)	2600	32.4	9	244	227	189	0	56	17	9
Effluent rolling (19.6ha)	592	34.1	9	244	227	189	0	56	4	2
Fawna farms (flats)	5188	50.6	12	195	213	189	0	6	22	18
Fawna farms - rolling	1229	53	12	195	216	189	0	6	5	4
Non effluent flat (71.9ha)	2512	39.3	10	195	203	189	0	6	14	9
Non effluent rolling (57.9ha)	2422	46.8	11	195	210	189	0	6	11	8
West of road flat (59.3ha)	1819	34.3	9	195	193	189	0	6	11	6
Swedes (53.7ha)	9602	179	39	90	33	90	0	0	-	33
Qe2 block	72	3	-	0	0	0	0	0	5	0

Phosphorus summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Effluent flat (67.1ha)	14	0.2	26	0	4
Effluent flat (89.5ha)	19	0.2	26	0	4
Effluent rolling (19.6ha)	8	0.5	28	0	4
Fawna farms (flats)	80	0.8	27	0	4
Fawna farms - rolling	58	2.5	30	0	4
Non effluent flat (71.9ha)	32	0.5	26	0	4
Non effluent rolling (57.9ha)	98	1.9	30	0	4
West of road flat (59.3ha)	16	0.3	27	0	4
Swedes (53.7ha)	69	1.3	50	0	0
Qe2 block	2	0.1	0	0	0

IFS Growth Proposed (Forestry)

Farm Nutrient Budget

	Total loss (kg/yr)			Loss per ha (kg/yr)			
Nitrogen	730			3			
Phosphorus	35			0.1			
Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	0	0	0	0	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	0	0	0	0	0	0	0
Rain/clover fixation	3	0	3	5	3	8	37
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	3	0.1	3	5	3	8	37
As product	0	0	0	0	0	0	0
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	0	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	0	0	0	0	0	0	0
Standing plant material	0	0	0	0	0	0	0
Inorganic mineral	0	0	0	0	0	0	0
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	0	0	0	0	0	0	0
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	0	0	0	0	0	0	0

Nitrogen Summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Ifs growth - easy hill (75.9ha)	190	2	-	0	0	0	0	0	28	26
Ifs growth - flat (39.1ha - 5.2ha setbacks)	85	2	-	0	0	0	0	0	12	12
Ifs growth - native bush	67	3	-	0	0	0	0	0	8	9
Ifs growth - qe2	22	3	-	0	0	0	0	0	3	3
Ifs growth - rolling pasture (135.7ha)	339	2	-	0	0	0	0	0	49	46

Phosphorus Summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Ifs growth - easy hill (75.9ha)	9	0.1	0	0	0
Ifs growth - flat (39.1ha - 5.2ha setbacks)	4	0.1	0	0	0
Ifs growth - native bush	2	0.1	0	0	0
Ifs growth - qe2	1	0.1	0	0	0
Ifs growth - rolling pasture (135.7ha)	16	0.1	0	0	0

Appendix D: DESC

FAW20289 Fawna Farms Limited- S1b RES base Calculation

775 Scotts Gap Feldwick Road, Scotts Gap

Supplier Number	34822
Storage max m³	1,046.38
90th percentile m³	881.52
Total pond useable volume m³	4,589.95
File owned by	Donna McBeath RES Rural Environmental Solitons
Created by	Donna McBeath RES Rural Environmental Solitons
Created on	25 Jul 2022
Last edited by	Donna McBeath RES Rural Environmental Solitons
Last edited on	27 Sep 2022

1b. RES Base Calculation

1,200 Peak Cows, high and low risk soils for effluent application; permanent shed roof diversion; yard, tanker pad and concrete lane diversion when cows are dried off; NO other Silage Pads or underpass or stand off pads or other areas drain to the pond; 50 lt/cow/day wash down water used in the dairy shed (no green wash allowed for); cobra rain gun (25m3/hr for a minimum of 2 hours per day when there is a soil moisture deficit of 3mm and increasing as the soil moisture levels increase); existing pond; effluent application all year round; 3 days emergency storage.

Other areas include: NIL

All information entered and assumptions made in this report are based upon information gathered from management and staff while onsite. Please check that all information and assumptions made in this report are correct.

Under the management system parameters described in this report and on the balance of probability, it is 90% likely that 882m³ of liquid effluent storage will be adequate for storage in any one year.

Based on the pond dimensions of 47.8m x 47.5m x 3.36m, with a 2:1 batter (as measured by RES on site), you currently have approximately 4,590m³ of effective storage (being a total hole in the ground volume of approximately 5,679m³) which is over 90% probability that you will have sufficient storage in any one year.

This calculation assumes that you will irrigate for around 340 days every year and that there are around 25 days each season that effluent cannot be applied to land and should be stored in the main effluent pond.

There is approximately 21,900m³ of effluent produced each season, approximately 60.0m³ per day.

Good management is essential for liquid effluent storage of this size.

The online version of the pond calculator has started showing the required solids storage but is likely to be over estimating the volumes required.

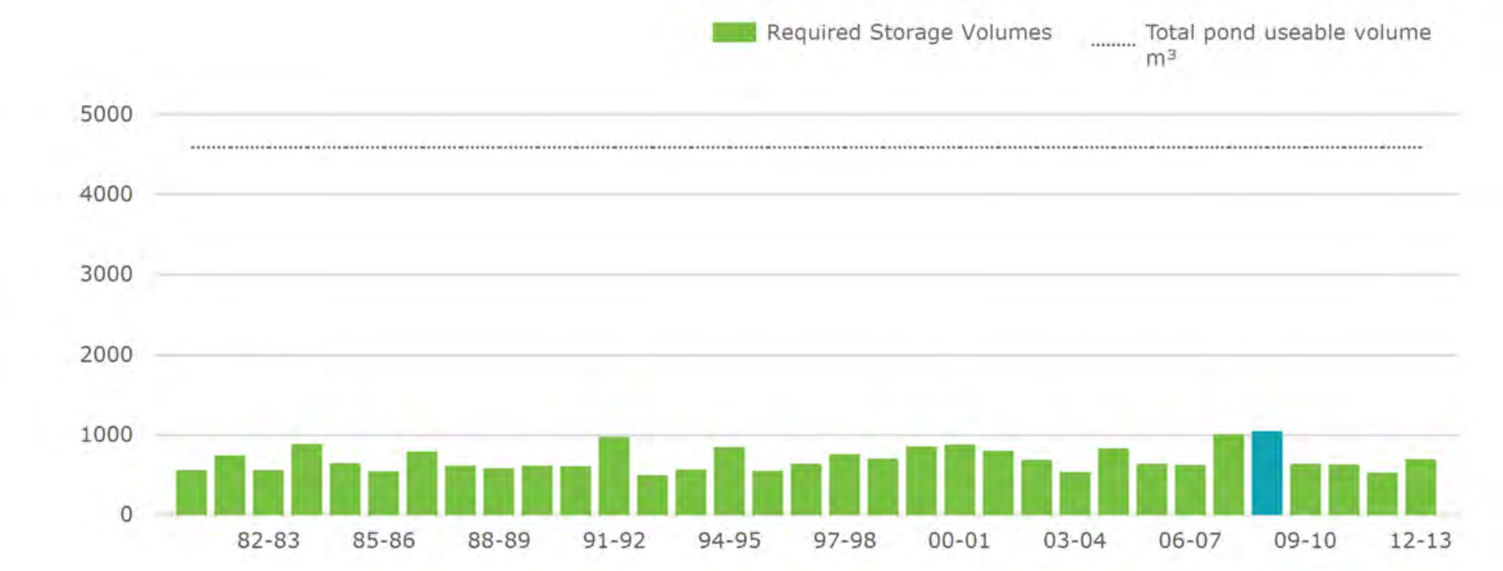
Under the management system parameters described in this report, approximately 280m³ of solids storage maybe required each year (this does not allow for extreme years, as this is likely to be overestimated as solids volumes are not generally increased from year to year; as liquids can be due to differing yearly rainfall), if the solids pond is emptied around November and March each season.

Based on the solids storage dimensions of 27.5m x 16.1m x 1.5m, with a 0:1 batter and front drive in wedge (as measured by RES), you currently have a total solids storage capacity of approximately 300m³ of solids storage capacity.

The solids storage surplus of 20m3 is likely to be underestimated by the calculator and if additional storage is required then solids can temporary be stored on the feed pad concrete area.

Good management is essential for solids storage this size.

Required Storage Volumes



Climate

Site	*Mean Rainfall mm*	*Altitude m*
Eastern Bush	1133	200

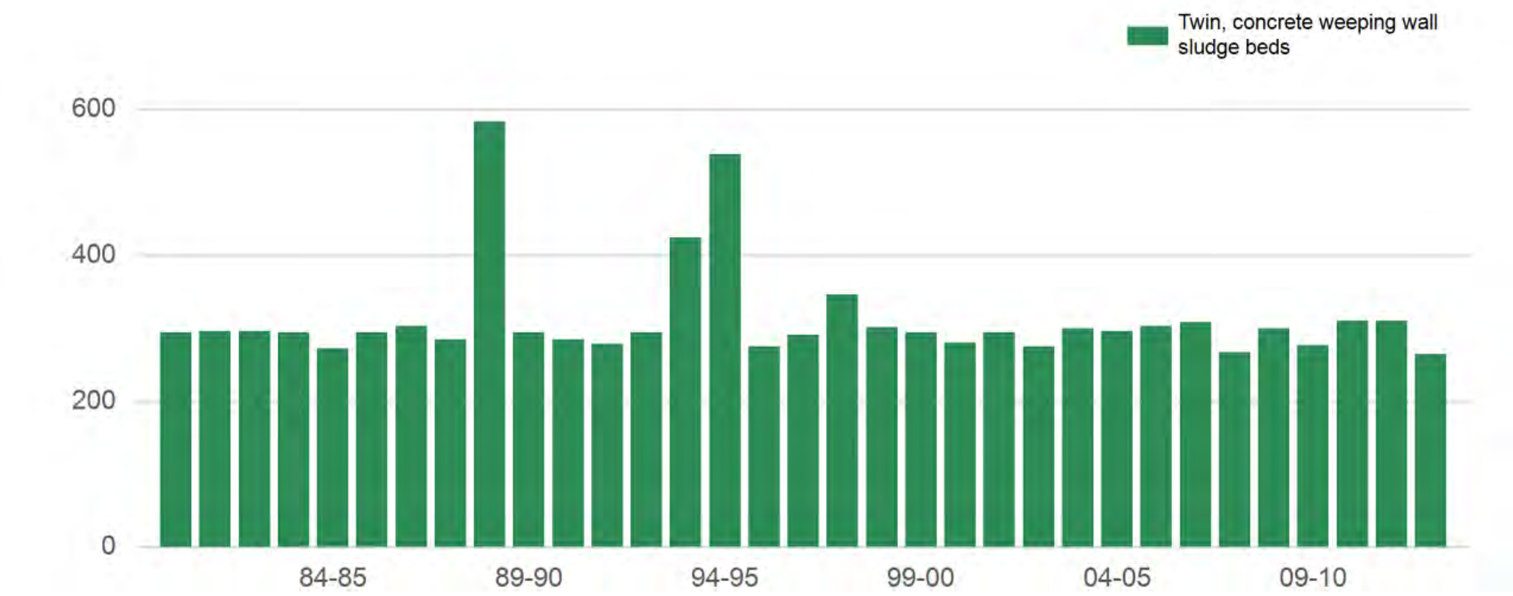
Soil

Low Risk Soil ha	*Minimum High Risk Soil ha*	*Surplus high risk soil ha*
96	0	152.4

Irrigation

Calculated option	*Application depth mm*	*Pump volume m³*
Option 1: Pump rate 25m³/hr and pump time 2hrs	3	50
Option 1: Pump rate 25m³/hr and pump time 4hrs	6	100
Option 1: Pump rate 25m³/hr and pump time 6hrs	9	150

Solid Storage Volumes



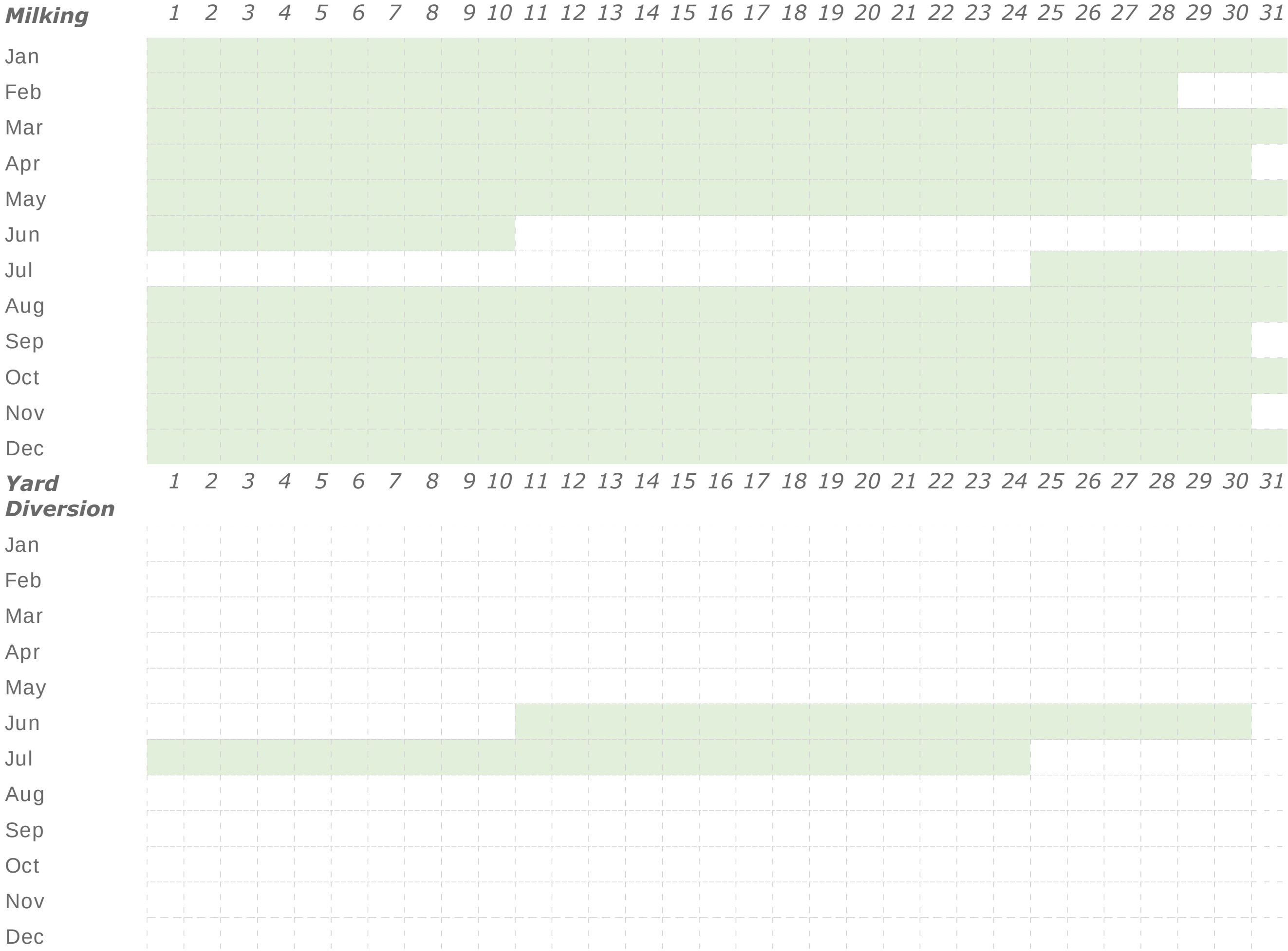
Catchment

Shed		Yard		Feedpad			Animal Shelter			Other
Area m²	*Diverted*	*Area m²*	*Diverted*	*Area m²*	*Covered*	*Diverted*	*Area m²*	*Covered*	*Diverted*	*Area m²*
520	Yes	1900	Yes	0	No	No	0	No	No	0

Yard

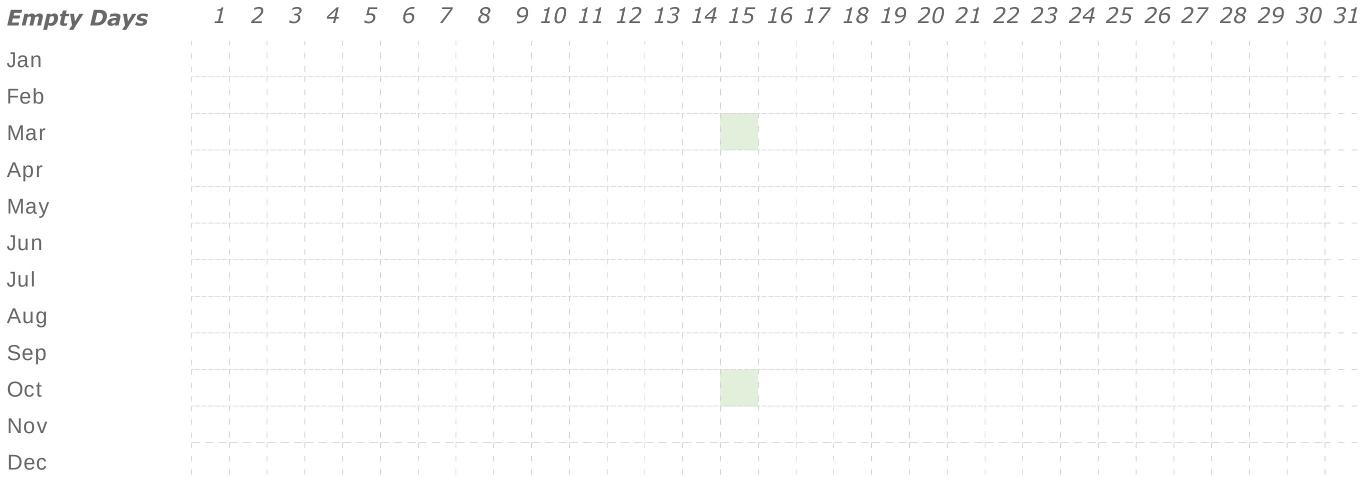
	Cows	*Hours*	*Volume m³*	*Wash LCD*
Jan	1200	8	60	50
Feb	1200	8	60	50
Mar	1050	8	52.5	50
Apr	1050	8	52.5	50
May	900	8	45	50
Jun	600	8	30	50
Jul	0	8	0	0
Aug	750	8	37.5	50
Sep	950	8	47.5	50
Oct	1200	8	60	50
Nov	1200	8	60	50
Dec	1200	8	60	50

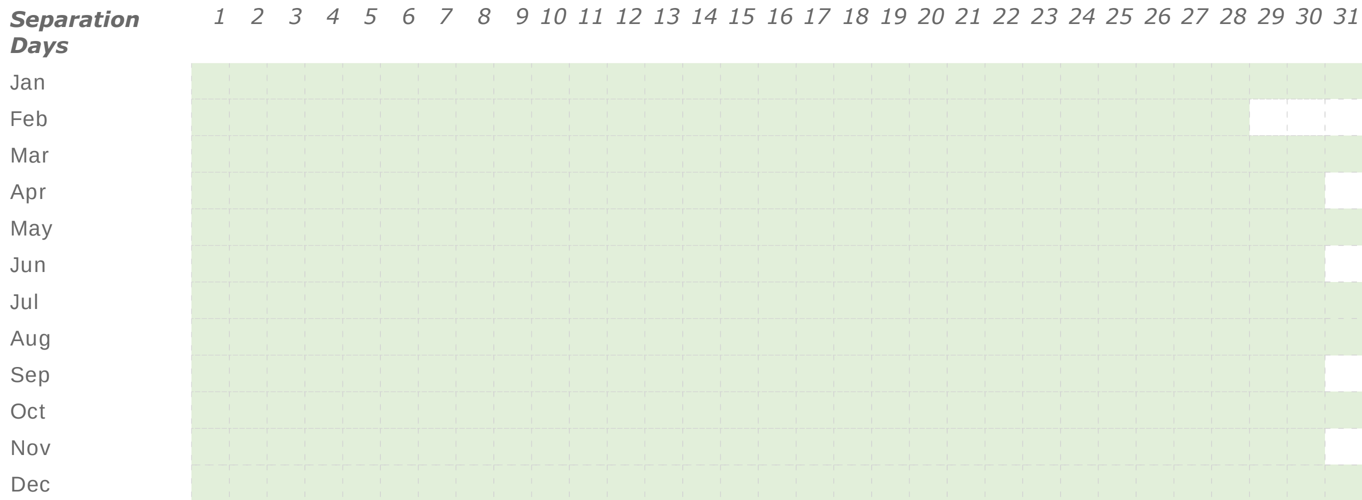
Calendar


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
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Yard 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
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Solid Unit

Name	Twin, concrete weeping wall sludge beds
Type	Regular
Dimension	length 27.5m, width 16m and height 1.5m
Input Source	Yard
Dry Matter %	20
Separator Efficiency %	15
Four Day Forecast SWDExcess	10
Minimum SWD Application	10





Storage

Emergency Storage Period	3

Storage Name	*Covered*	*Pumped*	*Type*	*Dimension*
Main Effluent Pond	No	On	Regular - Rectangular	length 47.8m, width 47.5m, height 3.36m, sludge height 0.001m freeboard height 0.5m and batter 2:1

Appendix

Season	*Required Storage Volumes m³*
80-81	557.53
81-82	738.28
82-83	557.85
83-84	881.73
84-85	648.17
85-86	543.07
86-87	787.27
87-88	616.82
88-89	585.32
89-90	610.36
90-91	603.44
91-92	973.62
92-93	494.97
93-94	561.92
94-95	843.46
95-96	551.29
96-97	634.52
97-98	759.91
98-99	700.00
99-00	850.23
00-01	880.70
01-02	798.55
02-03	686.91
03-04	533.25
04-05	831.41
05-06	635.45
06-07	623.10
07-08	1,004.38
08-09	1,046.38
09-10	637.57
10-11	626.16
11-12	527.85
12-13	689.95

Appendix E: Visual Assessment Weeping Walls

RURAL ENVIRONMENTAL SOLUTIONS
INDEPENDENT CONSULTANCY

Donna McBeath
(nee Corbin)

Mobile: 027 890 1234
Email: donna@res.kiwi.nz

Postal: 42 Charlton Road
Gore 9710

Tuesday, 6 September 2022

Zach Ward
Fawna Farms Ltd
370 Mossburn Lumsden Highway
RD2
Lumsden 9792

Client Name: Fawna Farms Ltd
Supply Number: 34822
Authority Number: AUTH-20146434-01-V1
Client Code: FAW20289

Subject: Visual Assessment report for assessment of 1 twin weeping wall sludge bed.

Dear Zach,

Thank you for engaging Donna McBeath t/a RES Rural Environmental Solutions (RES) to undertake visuals assessments of facilities within your effluent system. The following areas have been assessed:

- Area 1: twin weeping wall sludge bed located north of the dairy shed – **PASS**

The visual assessment/s were requested as part of the requirements for renewing your resource consents. A review of this report has been undertaken by a CPEng being, Heiko Franz (Treatment Solutions and Design Ltd), with the review being supplied separately.

The visual assessment has been undertaken as per the requirements of Rule 32D(a)(ii)(2)(a) of the Proposed Southland Water and Land Plan, no other assessments against any other rules have been undertaken for the purposes of this report. Being:

having no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility

Photos for each facility are contained in Appendix 2.

This visual assessment is required by Rule 32D(a)(ii) of the Proposed Southland Water and Land Plan. Fawna Farms Ltd asks that Environment Southland Accept these reports as demonstrating that the weeping wall sludge bed meets the permitted activity requirements of rule 32D of the Proposed Southland Water and Land Plan.

Area 1: twin weeping wall sludge bed located at the shed (NZTM2000 1201600 mE, 4890909 mN)

Inspection dates:

- Both sludge beds - initial assessment: 25/7/2022
- North sludge bed – final assessment: 17/8/2022
- South sludge bed – final assessment: 24/8/2022

Construction Material (Weeping wall sludge beds)l:	Concrete - Precast concrete walls with poured concrete base	*Construction Material (Weeping wall structure)l:*	Wood & Concrete - Wooden posts, rails and walls with concrete base
Shape:	Rectangle wedge at the front 1/4 of the facility, and a gently sloping floor towards the wooden walls.	*Dimensions (Approximately):*	27.5m long 8m wide 1.5m deep with a 0 to 1 internal batter on 3 sides and a drive in wedge on the eastern side.

Repairs required that were noted during the initial assessment:

- During the initial assessment it was noted that the sealant between the concrete wall panels in both sludge beds was coming away in places.
- Repairs have been undertaken by Baz Jansen Building.
- RES reassessed both sides and sighted the new sealant in place with evidence of the old sealant being removed on the base of the structure. RES has sighted both sides of the structure, when empty and repaired on the second and third visit to farm.

The following was noted by Donna McBeath (nee Corbin) from RES during the final assessment/s:

- Facility location/setbacks:
    - The facility is; Not within 50m of a waterway. Not within 50m of the boundary. Not within 200m of dwelling not on the property. Not located on top of a drain/tile.
- Facility reasonably empty:
    - The facility was emptied as far as reasonably practicable with most of the floor visible for assessment. The floor of the facility was lightly scraped to reasonably expose as much of the junctions and seals as possible for the assessment.
- Interior assessment:
    - Floor to side junctions, joints/seals:
        - The floor to side joints that were visible appeared to be intact and undamaged.
    - Corner or panel junctions, joints/seals:
        - The corner and panel junctions that were visible appeared to be intact and undamaged (there appeared to be some damage to the sealant between panel junctions that was noted during the initial assessment, however as noted above this was repaired at the time of the final assessment).
    - Inflow/outflow pipes:
        - A visual assessment of all incoming and outgoing pipe work did not show any damage to the pipe work or any missing sealant.
    - Interior damage:
        - A visual assessment of the interior of the facility was undertaken with no visual damage noted that would allow leakage from the facility.
    - Interior assessment summary:
        - There did not appear to be any cracks, holes or defects in the interior of the facility that would allow leakage.
- Exterior assessment:
    - Exterior ground assessment:

    - The immediate ground around the facility appeared to be firm with no soft areas or shrinkage away from the structure.
- Exterior structure:
    - No damage or areas of concern were noted around the exterior of the structure.
- Exterior assessment summary:
    - There did not appear to be any cracks, holes or defects on the exterior of the facility that would allow leakage.

The damaged sealant between the concrete wall panels has been replaced by a builder and have since been visual assessed by RES, with no signs of cracks, holes or defects noted.

A visual assessment to visually assess for cracks, holes or defects was undertaken on both sides of the structure by RES. This assessment did not note any cracks, holes or defects that would allow leakage from the facility.

Yours Faithfully,

Donna McBeath (nee Corbin)
Environmental Consultant
RES Rural Environmental Solutions

Appendices

Appendix 1 - Facility Layout

Figure 1 Layout of the facilities visually assessed.

Appendix 2 - Photos

Area 1 – twin weeping wall sludge bed

Photos taken during initial assessment on 25/7/2022.

Figure 2 Weeping wall structure and exterior of facility.

Figure 3 Exterior of facility.

Figure 4 Exterior of facility.

Figure 5 Exterior of facility.

Figure 6 Interior of weeping wall structure.

Figure 7 Interior of weeping wall structure.

Figure 8 North sludge bed.

Figure 9 South sludge bed.

Figure 10 Interior of north sludge bed.

Figure 11 Interior of north sludge bed.

Figure 12 Panel joints of north sludge bed.

Figure 13 Panel joints of north sludge bed with damage sealant.

Figure 14 Floor joints of north sludge bed.

Figure 15 Panel joints of north sludge bed with damaged sealant.

Figure 16 Floor joints of north sludge bed.

Figure 17 Weeping wall.

Figure 18 Weeping wall.

Figure 19 Weeping wall.

Figure 20 Panel joints of north sludge bed with damaged sealant.

Photos taken during final assessment of north sludge bed on 17/8/2022.

Figure 21 Panel joints of north sludge bed with repaired sealant.

Figure 22 Panel joints of north sludge bed with repaired sealant.

Figure 23 Panel joints of north sludge bed with repaired sealant.

Figure 24 Panel joints of north sludge bed with repaired sealant.

Figure 25 Panel joints of north sludge bed with repaired sealant.

Figure 26 Panel joints of north sludge bed with repaired sealant.

Figure 27 Panel joints of north sludge bed with repaired sealant.

Figure 28 Panel joints of north sludge bed with repaired sealant.

Figure 29 Panel joints of north sludge bed with repaired sealant.

Figure 30 Panel joints of north sludge bed with repaired sealant.

Figure 31 Panel joints of north sludge bed with repaired sealant.

Figure 32 Panel joints of north sludge bed with repaired sealant.

Photos taken during final assessment of south sludge bed on 24/8/2022.

Figure 33 Interior of south sludge bed.

Figure 34 Panel joints of south sludge bed with repaired sealant.

Figure 35 Panel joints of south sludge bed with repaired sealant.

Figure 36 Edge join of south sludge bed.

Figure 37 Edge join of south sludge bed.

Figure 38 Edge join of south sludge bed.

Figure 39 Floor joint of south sludge bed.

Figure 40 Floor joint of south sludge bed.

Figure 41 Panel joints of south sludge bed with repaired sealant.

Figure 42 Panel joints of south sludge bed with repaired sealant and edge joint.

Figure 43 Edge joint of south sludge bed.

Figure 44 Panel joints of south sludge bed with repaired sealant.

Figure 45 Edge joint of south sludge bed.

Figure 46 Panel joints of south sludge bed with repaired sealant.

Figure 47 Weeping wall of south sludge bed.

Figure 48 Weeping wall of south sludge bed.

Figure 49 Weeping wall of south sludge bed.

Figure 50 Panel joints of south sludge bed with repaired sealant.

Figure 51 Panel joints of south sludge bed with repaired sealant.

LANDPRO
Make the most of your land

Farm Environmental Management Plan

Fawna Farms Ltd

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Prepared For
Fawna Farms Ltd

Prepared By
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6 October 2022

QUALITY INFORMATION

Document: Farm Environmental Management Plan

Reference: 22417

Date: 6/10/2022

Prepared By: Rosie Forbes

Reviewed By: Tilly Hasselman

Version: 1

PURPOSE

A Farm Environmental Management Plan can help recognise and manage on-farm environmental risks. Here we have identified some of the potential risks associated with Fawna Farms Ltd and how these will be mitigated. We have described the environmental conditions present on the farm and looked at how these will be managed. Where possible located and time frames for mitigations have been identified.

Document Control Statement:

Landpro retains control over the electronic version of this document up to the point of delivery to our client.
Clients are provided with a final electronic version of this document from which they are able to make changes.
If the final document is changed by a client, that should be noted in the document version control.
To ensure the farm owner's copy of the Farm Environmental Management Plan (FEMP) is kept up-to-date and that the most recent version is used, the farm owner will:

- Review the FEMP at least on an annual basis. The review shall consider whether the FEMP still accurately reflects on-site activities and whether any improvements to management and contingency procedures need to be made. The results of the review shall be reported to Environment Southland within one month of the review being undertaken; and
- Manage the master copy and any other paper or electronic copies of the FEMP; and
- Keep a summary of updates, versions and dates and distribution lists; and
- Ensure FEMP updates are distributed to all relevant farm staff and Environment Southland; and
- Ensure any out-of-date copies are discarded when updates are distributed.

Contents

1. Introduction

1.1 Objectives of the Farm Environmental Management Plan

- *Comply with all legal requirements related to land use and discharge;*
- *Take all practicable steps to minimise the risk of harm to onsite and nearby water resources;*
- *Take all practicable steps to ensure that there is an adequate supply of soil nutrients to meet plant needs;*
- *Take all practicable steps to minimise the risk of harm to significant vegetation and/or wildlife habitat;*

1.2 How to achieve this

- *Identifying and documenting contaminant pathways for the property (based on Physiographic Zone)*
- *Identifying relevant good management practices (GMP) and where they will be required to be implemented to minimise environmental risks*
- *Documenting evidence to be provided to show adherence with consent conditions.*

1.3 Using this Plan

This Plan identifies 'Action Points' within each section where further actions are required. A traffic light system has been used to identify actions that are not urgent but require some action, yellow actions to complete with 12-months, and red being matters that require immediate attention.

Green – not urgent
Yellow – to do within 12-months
Red – requires immediate action

This document has been prepared to support the consent application for Fawna Farms Ltd. However, it also contains management practices which promote industry best practice.

2. Action Points Summary

Location	Mitigations - Action Point	
Proposed Additional Dairy Platform	Fence off all unfenced waterways	Fence off any unfenced waterways in the new block in areas that will be used for pastoral grazing.
	Manage erosion	Find and map areas with sheet erosion, these should be temporarily fenced off to prevent further erosion. The owners will become more familiar with the location of these areas after a period of time on the property. Look to permanently fence these over time.
	Culvert entrances	Temporarily fence off culvert entrances that have got existing pugging/erosion – ideally with a grass buffer to help capture contaminants. These could be permanently fenced in time. Look to see the functionality of culverts and if they could be improved.
Whole Farm	Create paddock winter grazing plans	Create a winter grazing plan with diagrams that identify critical source areas (CSAs). Graze down towards a CSA, ensuring that the area around the CSA is grazed last to act as a filter. Where possible, leave a buffer strip ungrazed.
	Photo records of wintering GMPs	Keep records of your practice and photographic proof prior to stock grazing, during winter and at the end of the winter season.
	Nutrient Budget	Update Nutrient Budget in three years, or when a material change occurs with an CNMA approved nutrient modeller.
	Nitrogen Records	Supply Synthetic N fertiliser records annually to Environment Southland.
	Update farm map	Review farm map before the 2023-24 season and add in additional critical source areas, plus add where the known tile drains are.
	Swales/Ephemeral	Temporarily fence swales/ephemeral waterways during wet periods to reduce risk of contaminant loss and soil damage.

3. Farm Information

The property is located within the Orauea River catchment, 1620 Ohai Clifden Highway, as shown in Figure 1 below.

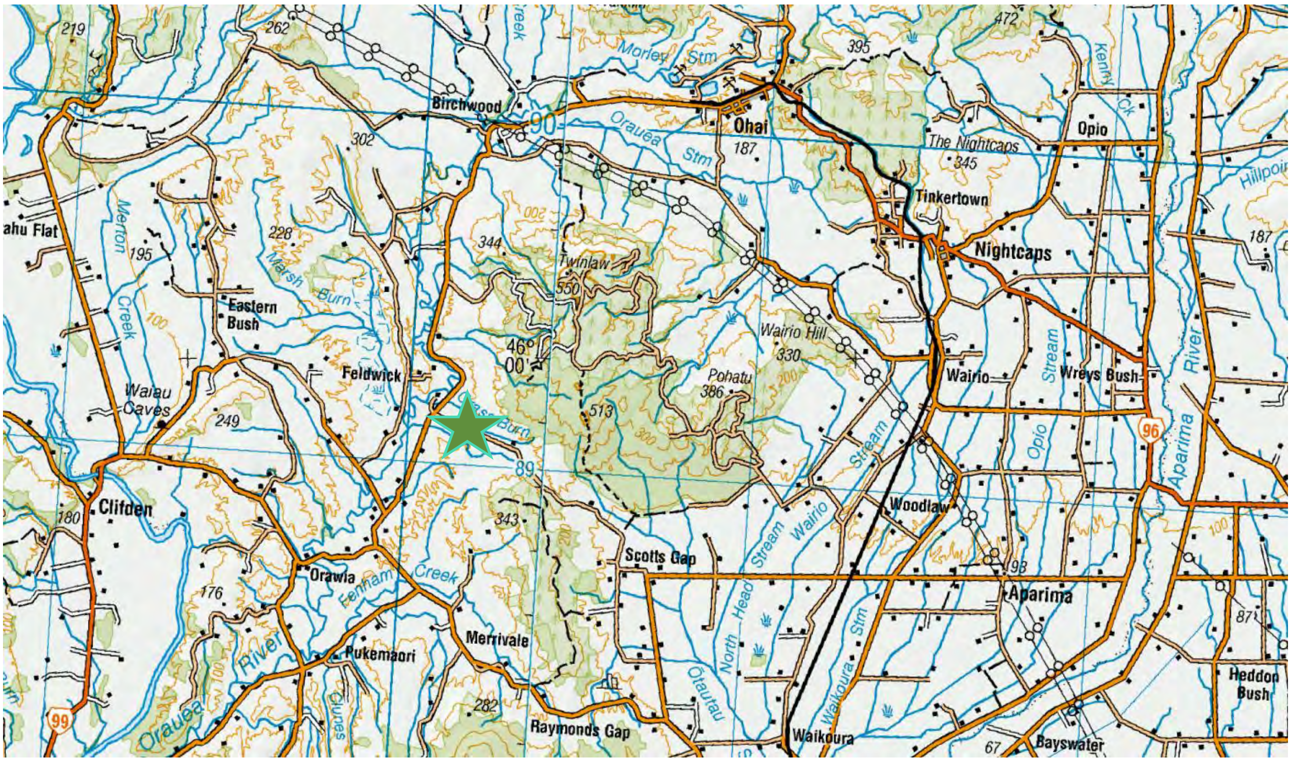

Figure 1: Location of property (Source: NZTopoMap).

Fawna Farms Ltd took over the existing dairy property on 1st June 2022 and, following the completion of the subdivision, will purchase 165.9ha of the neighbouring block currently owned by IFS Growth Limited. Fawna Farms Limited intend to extend their dairy platform, milking more cows and wintering all cows on farm (rather than sending off farm to winter grazing). The steeper land, which will remain in the ownership of IFS Growth will be planted into forestry. See Figure 2 below for the different land management units.

7

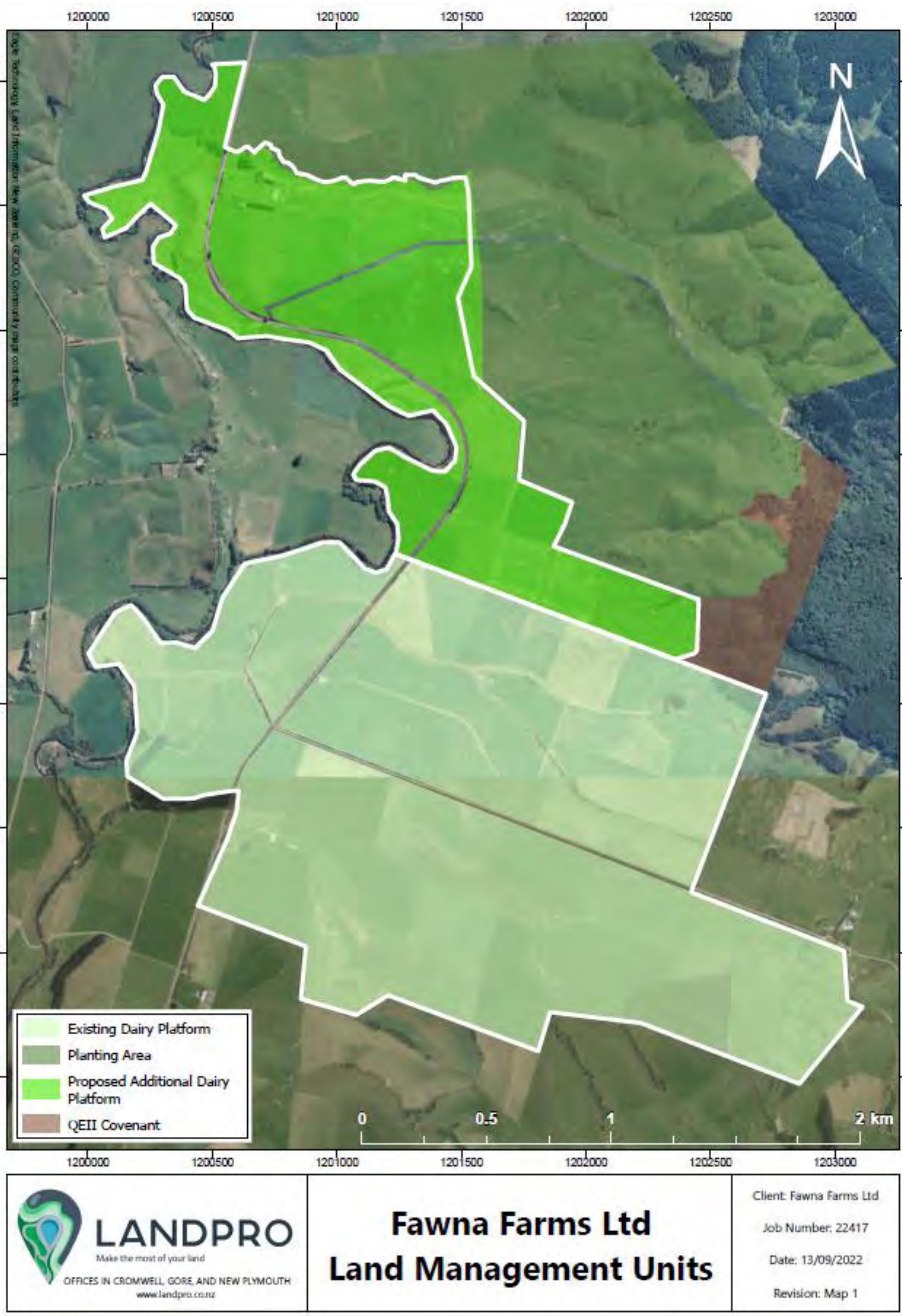

Figure 2: Land management units

8

3.1 General Property Details

<table>
<tr><td>Farm Name:</td><td colspan="2">Fawna Farms Ltd</td></tr>
<tr><td>Farm Owner:</td><td colspan="2">Fawna Farms Ltd</td></tr>
<tr><td>Person in Charge:</td><td colspan="2">Ross Conder 027 207 6444</td></tr>
<tr><td>Farm Address:</td><td colspan="2">1620 Ohai Clifden Highway</td></tr>
<tr><td rowspan="2">Land Parcels:</td><td colspan="2">Existing Dairy Platform:
Lot 3 DP 340527; Pt Section 94 Waiau SD; Section 1 SO 452868 Section 18 Merrivale Settlement No 2; Pt Section 29 Blk IX Waiau SD; Pt Section 94 Waiau SD; Pt Section 94R Waiau SD; Pt Section 29 Blk IX Waiau SD; Section 16 Merrivale Settlement No 2; Section 110 Waiau SD; Pt Section 8 Blk IX Waiau SD</td></tr>
<tr><td colspan="2">New Dairy Support Block (proposed dairy platform)
170ha of below land parcels. Subdivision consent to be filed with SDC.
Lot 2 DP 7360; Lot 7 DP 7360
Lot 6 DP 7360; Lot 1 DP 7360
Lot 3 DP 7360; Lot 5 DP 7360
Lot 4 DP 7360; Section 250 Waiau SD</td></tr>
<tr><td rowspan="3">Farm Area:</td><td>Total Farm Area:</td><td>Current: 370.9ha
Proposed: 536.8</td></tr>
<tr><td>Effective Farm Area:</td><td>Current: 365.3 ha
Proposed: 506.2 ha (dairy platform)</td></tr>
<tr><td>Effluent Disposal Area:</td><td>Current application area 248.4 and proposed application area 271.4 ha</td></tr>
<tr><td rowspan="2">Climate:</td><td>Annual average rainfall:</td><td>968 mm</td></tr>
<tr><td>Mean Annual Temperature:</td><td>10.3°C</td></tr>
<tr><td>Geology and topography:</td><td colspan="2">Flat to rolling</td></tr>
</table>

3.2 Farming Operation Overview

Type:	Dairy and dairy support
Current resource consents:	Discharge permit AUTH-20146434-01-V1, Water permit AUTH-20202016
Peak Cows Milked *(as per consent)*	Current: 900 cows Proposed: 1,200 cows
Winter Milking:	Nil, expect for early/late milkers and slipped cows
R2's:	Current: 220 incalf R2 heifers return 1st May Proposed: 285 in calf R2 heifers return 1st May.
Calves:	Current: 230 calves on until 1st May Proposed: 300 calves raised and sent off farm 1st December
Other stock:	Current: 30 beef cross calves reared. 20 sold 1st Dec, rest taken through to Feb as R2s Proposed: None
Feed:	Pasture based, with in shed feeding
Supplementary Feed Bought:	150tDM DDG, 150tDM PKE
Winter Grazing Area (ha):	53.7ha (proposed)
Winter Grazing Area 1 July 2014 – 30 June 2019 (ha):	53.7ha

3.3 Physiographic Zones

Physiographic zones, developed by Environment Southland help us to better understand how contaminants move through the landscape. Each zone has common attributes that influence water quality, such as climate, topography, geology and soil type. Contaminants can move from the land to waterways via:

1. overland flow (or surface runoff)
2. artificial drainage - e.g. tile drains and mole pipe drainage
3. deep drainage (or leaching) - of either nitrogen or phosphorus to groundwater
4. lateral drainage (or horizontal movement through soil) – of phosphorus and microbes

Some zones have more than one contaminant pathway, otherwise called *"variants".* These are either:

- Overland flow (o) – typically areas with steeper slopes
- Artificial drainage (a) – areas with artificial drainage

Physiographic Zone	Key Contaminant Transport Pathways (✓)		
	Overland Flow	Artificial drainage	No Variant
Bedrock/Hill Country	✓		✓
Oxidising		✓	✓
Gleyed	✓		✓

3.3.1 Physiographic Zone Good Management Practices

Physiographic Zone	Good Management Practice
Oxidising (artificial drainage)	Protecting soil structure, particularly in gullies and near stream areas
	Reducing phosphorus use and loss
	Reducing the accumulation of surplus nitrogen in the soil, particularly during autumn and winter
	Avoiding preferential flow of effluent through drains
	Capturing contaminants at drainage outflows
Bedrock/Hill Country and Gleyed (overland flow)	Protecting soil structure, particularly in gullies and near stream areas
	Managing critical source areas (CSA)
	Reducing phosphorus use or loss

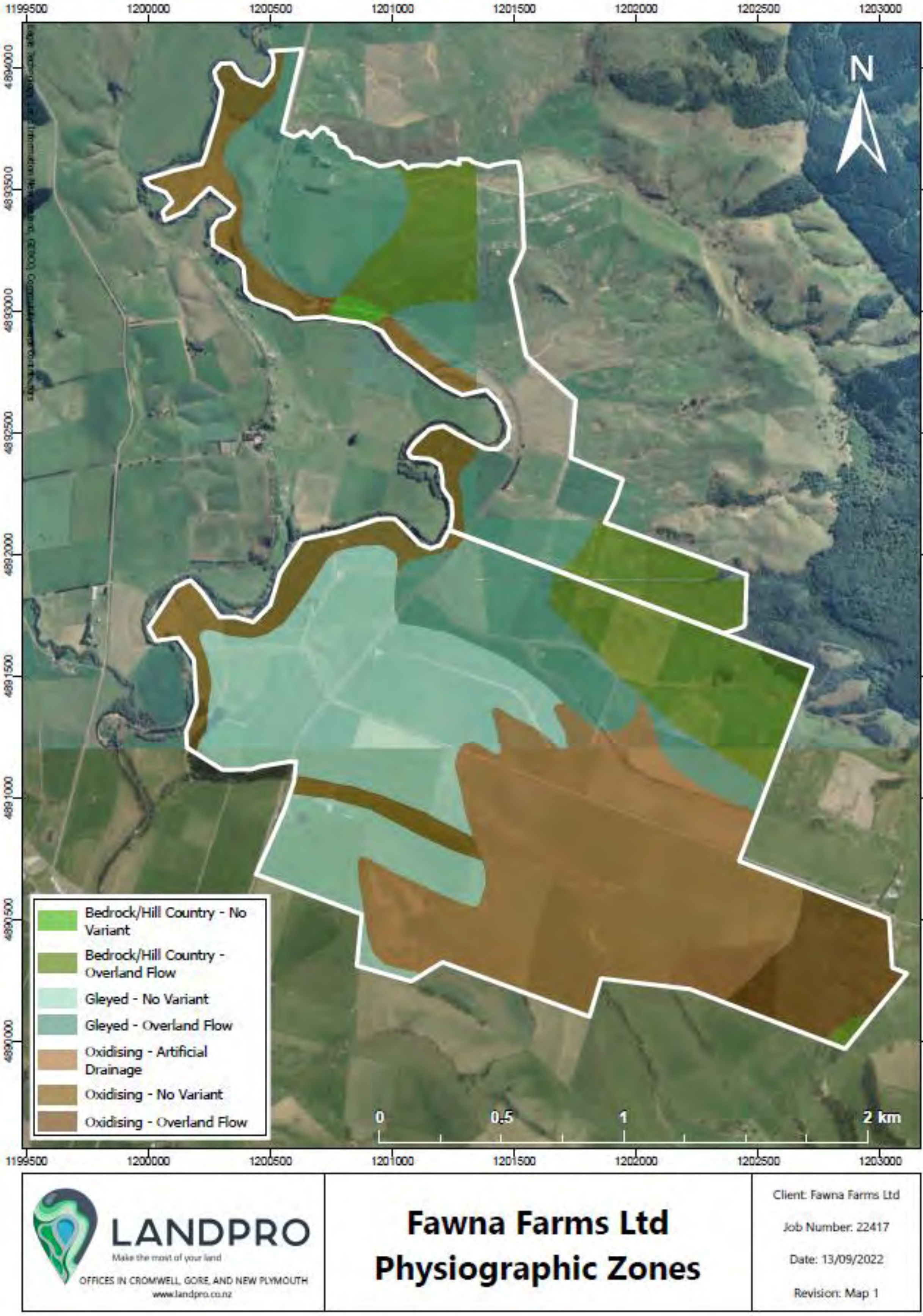

Figure 3: Physiographic Zones and variants present.

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3.4 Soil Types

This section of the FEMP documents the soil types across the property. The soil maps below show the spatial distribution of the soil types across the entire property according to Environment Southland Beacon Mapping Service.

Soil Characteristics and Vulnerability Factors					
	Soil Type	**Vulnerability and Risk Factors**			
		NZSC	**Structural Vunerability**	**Nutrient Leaching**	**Waterlogging**
Soils	Hedgehope (Hedge_4a.1)	Brown	Moderate	Low	Moderate
	Aparima (Apar_6a.1)	Brown	Moderate	Moderate	High
	Ohai (Auchr_9b.1)	Pallic	Moderate	Medium	High
	Ihaka (Ihak_23a.1)	Brown	Moderate	Medium	Moderate
	Malakoff (Malok_3a.1)	Melanic	Moderate	Medium	Low
	Eureka (Eure_22a.1)	Gley	High	Very Low	High
	Waiau (Waiau_3a.1)	Recent	High	Very High	Very Low
	Makarewa (Makar_3b.1)	Gley	Moderate	Very Low	High
	Tuatapere (Tuap_6b.2)	Melanic	Low	Medium	Very Low
FDE classification	Mostly Category C – Sloping land				
FDE risk groundwater	Unclassified				
FDE risk surface water	Low to high adjacent to Orauea River				

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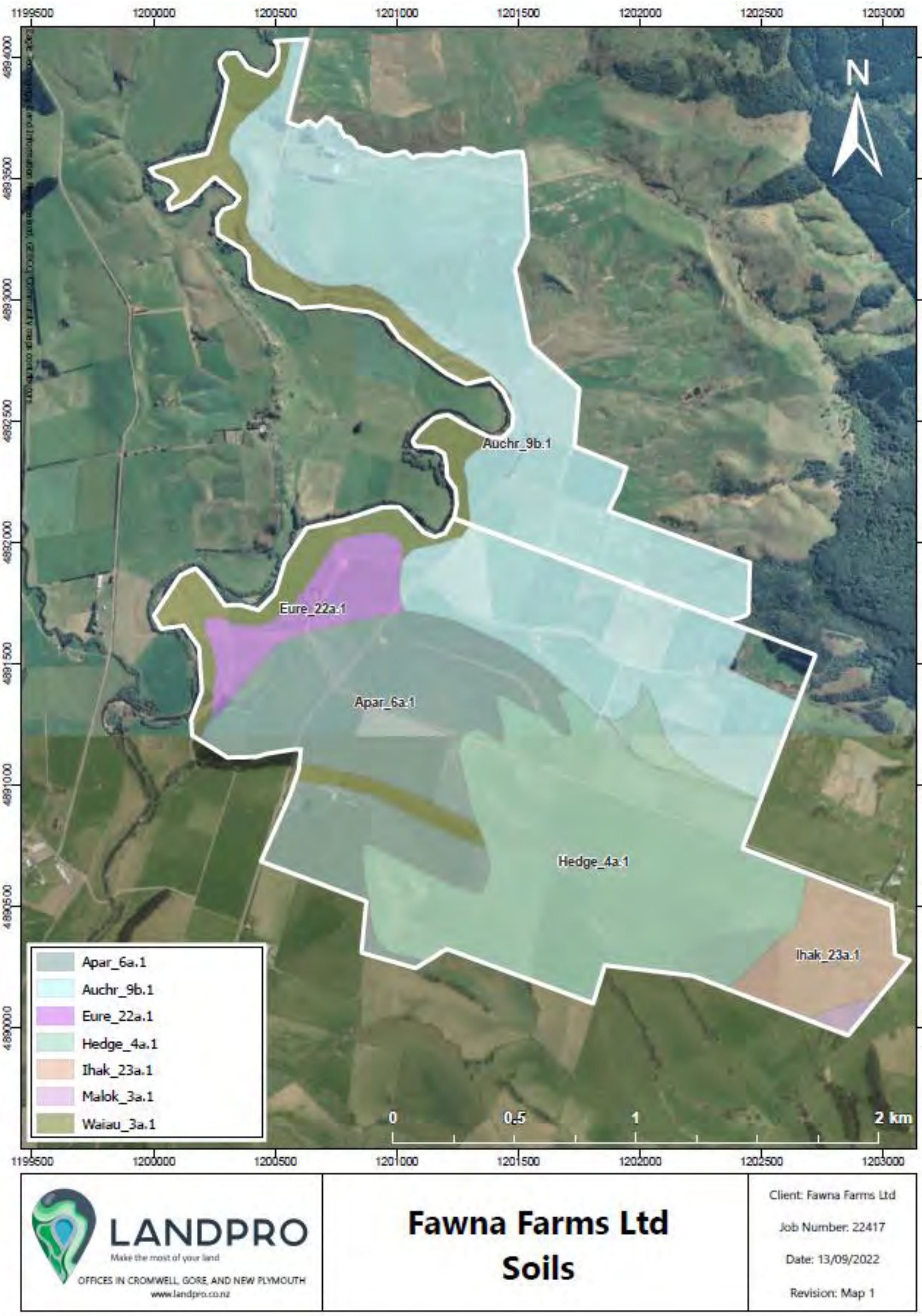

Figure 4: Soil types on the property

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4. Good Management Practices

The table below outlines general good management practices which will be undertaken across the whole farm.

Good Management Practice	
Cultivation and soil structure / erosion prone land	Manage farming operations to minimise direct and indirect losses of sediment and nutrients to water, and maintain or enhance soil structure, where appropriate.
Ground cover	Manage periods of exposed soil between crops/pasture to reduce risk of erosion, overland flow and leaching.
Sediment, phosphorus and faecal bacteria	Identify risk of overland flow of sediment and faecal bacteria on the property and implement measures to minimise transport of these to water bodies.
	Manage farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallows and other sources of run-off to minimise risks to water quality.
	To the extent that is compatible with land form, stock class and intensity, exclude stock from waterways
	Monitor soil phosphorus levels and maintain them at or below the agronomic optimum for the farm system.
Nutrient Management	Manage the amount and timing of fertiliser inputs, taking account of all sources of nutrients, to match plant requirements and minimise risk of losses.
	Ensure equipment for spreading fertilisers is well maintained and calibrated.

5. Nutrient Management

Nutrient Management	Manage the amount and timing of fertiliser inputs, taking account of all sources of nutrients, to match plant requirements and minimise risk of losses.
	Store and load fertiliser to minimise risk of spillage, leaching and loss into water bodies.
	Ensure equipment for spreading fertilisers is well maintained and calibrated

As per requirements of the pSWLP, the Plan contains a nutrient budget which includes nutrient losses to the environment and has been calculated using OVERSEER. Nutrient management is carried out with the objective to maximise nutrient use and efficiency while minimising nutrient losses to water. Soil testing is carried out annual with nutrient reports produced in order to assess fertiliser requirements, and any supplements required for pasture and animal health.

5.1 Nutrient Budget

An OVERSEER nutrient budget is prepared and updated for the whole farm, and each Farm Management Unit annually by a CNMA approved advisor. The nutrient budget completed (see appendix B for full report) is used to assess where opportunities for minimising nutrient losses are possible and where improvements in nutrient efficiencies are possible. A summary of nutrient losses can be found in the table below.

	Nitrogen and Phosphorus losses (kg).			
	Total N	**N/ha**	**Total P**	**P/ha**
Proposed – new dairy platform	28,835 kgN	54 kgN/ha	613 kgP	1.1 kgP/ha

Nitrogen loss to water is 54kgN/ha and Phosphorus loss to water is 1.1kgP/ha. Please see appendix B for full report.

Mitigations - Action Point	
Nutrient Budget	Update Nutrient Budget in three years, or when a material change occurs with an CNMA approved nutrient modeller.
Nitrogen Records	Supply Synthetic N fertiliser records annually to Environment Southland.

6. Greenhouse Gas Emissions

6.1 Overview

There is increasing pressure to reduce the greenhouse gas emissions associated with agriculture and food production at the farm level. As per the He Waka Eke Noa programme requirements, this Plan contains a Greenhouse Gas report which has been calculated using OVERSEER. This reports total farm Greenhouse gas emissions to the atmosphere for each gas (methane, nitrous oxide and carbon dioxide).

Details of this can be found in the summary table below.

Greenhouse gas emissions (eCO2/tonnes/yr)			
Methane	**N2O**	**CO2**	**Total**
3972.7 T eCO2/year	1358.6 T eCO2/year	678.8 T eCO2/year	6010.1 T eCO2/year

The table below outlines a number of greenhouse gas reduction opportunities to consider. By changing the farming system from the current to the proposed dairy system this is already achieving efficiencies and lowering greenhouse gas emissions. These have ticks beside them in the table below.

Opportunity	On farm practice	✓
Improve the efficiency of pasture and crop production	Minimise N-surplus through reduced N-fertiliser use	✓
	Reduce N-surplus through reduced use of supplementary feed	✓
	Optimise soil pH levels	
Reduce total feed eaten	Cull less productive stock early	
	Adjust stocking policy	✓
	Reduce stock losses and optimise replacement rates	
	Increase animal performance through genetic selection	
Match feed demand with pasture growth and utilisation	Reduce bought-in supplementary feed	✓
	Use of lower protein forages	
	Optimise pasture quality and production	
Capture and store carbon in vegetation	Plant indigenous or exotic trees	✓
	Minimise periods of bare land	

7. Critical Source Areas

Critical Source Areas are identified as areas on farm that have a higher risk of contaminant loss. They are often low lying, wet areas and good management can lead to a significant reduction in sediment and nutrient loss from your farm.

Good Management Practice for Managing Critical Source Areas
Permanently fence and retire stock from areas that are constantly wet. Planting these areas will help to stabilise and reduce sediment loss.
Provide temporary fencing around CSAs that appear when conditions aren't favourable.
Create a buffer zone around CSAs to slow overland flow and reduce the risk of sediment and nutrient runoff. This is particularly important when CSAs are nearby a waterway.
Laneways can easily become CSAs by transporting contaminants directly into surface water. Ensure laneways are constructed with good camber and cu toffs alongside to hep divert water into nearby paddocks and away from waterways.
Limit cropping in areas that have increased slopes, areas that remain wet for extended periods or are likely to become ephemeral waterways.
Implement good management practice when it comes to winter grazing – this is outlined in further detail below.
Ensure troughs, feed and shelter are located away from waterways.

A number of Critical Source Areas have been identified on Fauna Farms Ltd, these are shown on Figure 5 below.

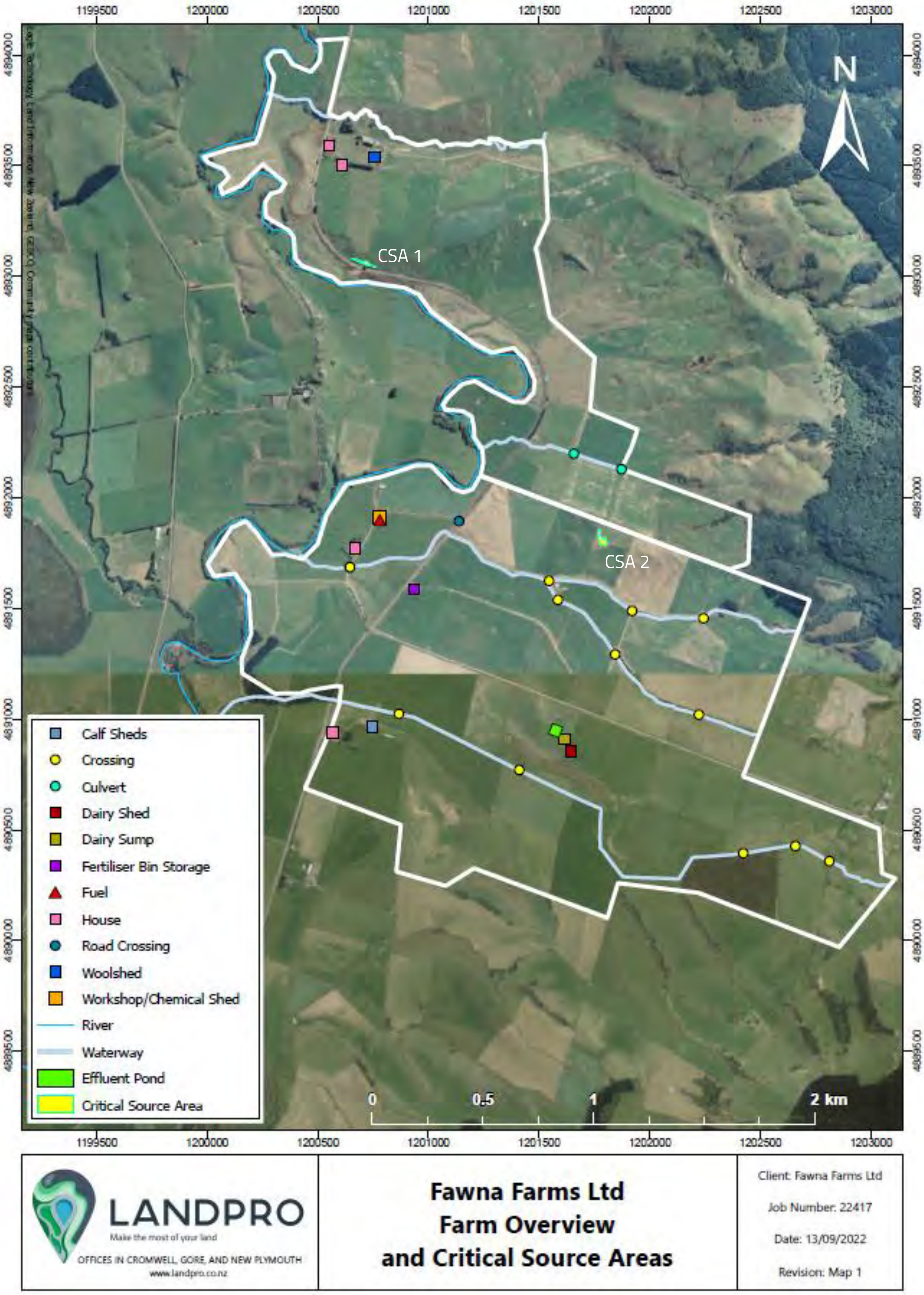

Figure 5: Infrastructure and critical source areas

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Photo	Mitigation
	**Farm Tracks:** tracks were generally in good condition The Fawna Farms Ltd team are maintaining these regularly, making sure pot holes are filled in and that the track is at an appropriate camber to allow water to shed to adjacent paddocks and reduce ponding.
	**Erosion scars on proposed block.** There is sheet erosion on the dairy support block/proposed dairy which increases risk of sediment and phosphorus contaminant loss via overland flow (see CSA 1 and 2 on map). It is recommended to fence areas with erosion scars off to reduce this erosion This can be temporary fencing when stock are grazing.
	**Road culvert on proposed block** Under previous management, there is slight erosion and pugging around an area where water moves under the road. Fencing would protect this area from further degradation, ideally with a grass buffer to help filter any contaminants in the surface water. This can be temporary fencing when stock are grazing. It would be beneficial to look at these culverts functionality and if they could be improved.

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Photo	Mitigation
 	**Swales/ephemeral waterways** There are several swales in paddocks that can run intermittently during the winter or when there are periods of high rainfall. These should be temporarily fenced when stock are grazing these in wet conditions, to reduce pugging and contaminant loss into the waterways. Both photos show where under previous management stock have not been fenced out of the swale. This damages soil structure, pugs the soil, and there is an increased risk of contaminant loss through overland flow.. The Fawna Farms Ltd team will fence these areas prior to grazing during wet periods.

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Photo	Mitigation
  	**Waterways:** All creeks on the existing dairy platform are well fenced with grass buffers that can attenuate nitrogen from surface runoff. Most of the bridges have grass nibs which prevent sediment/runoff running directly into the streams. It is also important that track runoff is directed into adjacent paddocks, rather than into nearby waterways. Fawna Farms Ltd will continue to maintain these waterways. Some creeks on the dairy support/proposed dairy platform are not currently fenced but Fawna Farms Ltd are committed to fencing these.

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Mitigations - Action Point	
Fence off all unfenced waterways in the proposed new block	Fence off any unfenced waterways in the new block in areas that will be used for pastoral grazing.
Manage erosion in the proposed new block	Find and map areas with sheet erosion, these should be temporarily fenced off to prevent further erosion. The owners will become more familiar with the location of these areas after a period of time on the property. Look to permanently fence these over time.
Culvert entrances in the proposed new block	Temporarily fence off culvert entrances that have got existing pugging/erosion – ideally with a grass buffer to help capture contaminants. These could be permanently fenced in time. Look to see the functionality of culverts and if they could be improved.
Swales/Ephemeral	Temporarily fence swales/ephemeral waterways during wet periods to reduce risk of contaminant loss and soil damage.
Update farm map	Review farm map before the 2023-24 season and add in additional critical source areas, plus add where the known tile drains are.

8. Intensive Winter Grazing

Carefully planning around how you winter graze stock can reduce impacts on waterways. Because Fawna Farms Ltd took over this farm in June 2022, they are still making plans on where to plant the winter forage crops. Both properties have had a history of winter grazing; there was 24.7 ha on the current dairy platform and 33.7 ha on the proposed new block within the reference period (1st July 2014 – 30th June 2019).

Winter grazing should be a planned process from start to finish; it is advised to make a grazing plan for each specific paddock. Please see Appendix C for factsheet from DairyNZ around a Winter Grazing Plan. The following Good Management Practices should be implemented for intensive winter grazing.

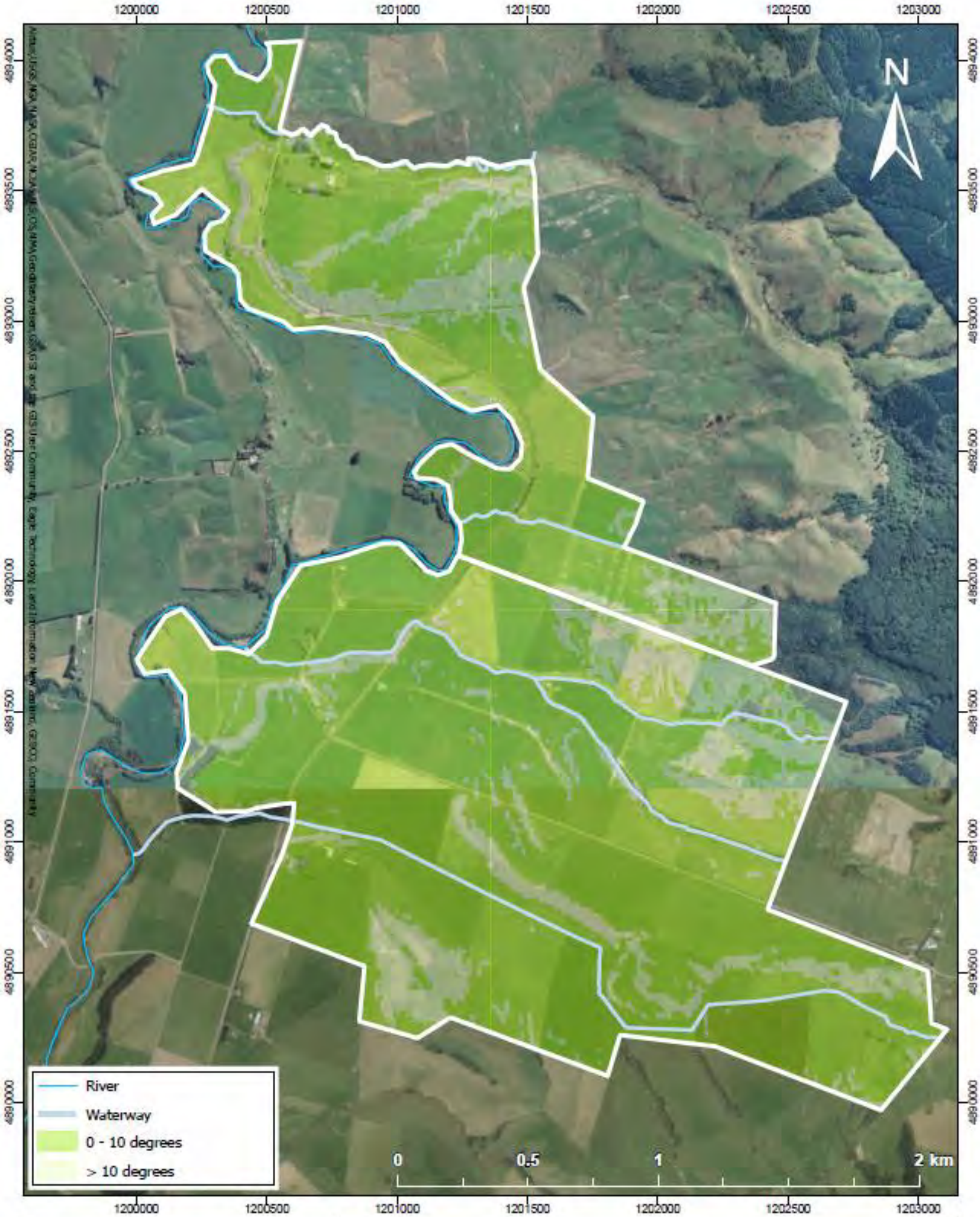
	Good Management Practices for Intensive Winter Grazing	✓
Planning (prior to planting)	If winter forage cropping occurs on slopes over 10 degrees, consent will be required	
	Create a winter grazing plan with diagrams identifying critical source areas (CSAs). Graze down towards a CSA, ensuring that the area around the CSA is grazed last to act as a filter. Where possible, leave a buffer strip ungrazed.	
Sowing	Sow crops along, rather than up and down the slope of a paddock.	
	Waterways: A 5m vegetated buffer strip from the edge of a waterway is left, and stock excluded from.	
	Critical Source Areas are not to be cultivated and left in grass.	
Winter Grazing	Stock are back-fenced.	
	Transportable water troughs are provided and located away from waterways and CSAs.	
	Supplementary feed is placed in portable feeders and located away from waterways and CSAs.	
	Mob size is no more than 120 cattle.	
	Take reasonable steps to reduce pugging.	
After	Resow as soon as practicable.	
	Review winter grazing, what worked, what didn't, how next year can be improved.	

Adverse Weather Management Plan for Intensive Winter Grazing	✓
Keep heavy vehicles out of paddocks, ensure all work requiring heavy vehicles is undertaken prior to winter.	
Shift stock to a drier paddock or one with better drainage.	
Feed stock more hay and silage to minimise stock movement.	
Practice on/off grazing where possible.	
Ensure stock have suitable resting/lay down area.	

The following figure (figure 6) shows the different slope classes across the farm. The dark green areas have slopes less than 10 degrees and can likely be cropped without a consent required under the National Environmental Standards for Freshwater. This map gives an indication and should be ground truthed on farm. If there are areas in a paddock that have a slope greater than 10 degrees these should not be cultivated without an IWG consent.

Disclaimer: This map gives a broad indication of slope across the property; however, Central Government is yet to decide which mapping tool will be used to determine which land has more than a 10° slope. As such, this map should only be used as an indication of which areas may be affected by the winter cropping regulations.

Mitigations - Action Point	
Create paddock winter grazing plans	Create a winter grazing plan with diagrams that identify critical source areas (CSAs). Graze down towards a CSA, ensuring that the area around the CSA is grazed last to act as a filter. Where possible, leave a buffer strip ungrazed.
Photo records	Keep records of your practice and photographic proof prior to stock grazing, during winter and at the end of the winter season.



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Fawna Farms Ltd
Slope

Client: Fawna Farms Ltd
Job Number: 22417
Date: 13/09/2022
Revision: Map 1

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9. Riparian Management

The majority of the property is contained within the Waiau Surface Water Management Zone and is not currently in a Groundwater management Zone.

The Orauea River runs along the western boundary of the property in a north-south direction and this section of it is maintained by Environment Southland under the Southland Flood Control and Drainage Bylaw 2020. There are several tributaries that move through the farm and discharge to the Orauea River. There is one unnamed tributary, the Grass Burn stream, and Gap Creek, which all flow in a westerly direction and discharge to the Orauea River. See figure 5 for a map showing these. There are no toxic algae alerts in the Waiau catchments. There is a popular bathing site downstream of the property in the wider catchment on the Waiau River at Tuatapere Bridge as per Appendix G of the PSWLP.

All waterways across the existing dairy platform have been fenced to prevent stock access, however some of the waterway on the new dairy support/proposed dairy platform will need to be fenced and Fawna Farms Ltd are committed to doing this. There are grass buffers (between the creeks and the fences) of varying sizes which will reduce contaminant loss. Where appropriate and as part of good grazing management, temporary fencing will also be erected to prevent any point source discharges occurring. This includes fencing off swale areas where they may directly discharge to surface water. Such practices will be adopted as set out elsewhere in this plan as part of the management of CSAs.

10. Biodiversity and Forestry

Biodiversity	Consider using native trees as shelterbelts
	Planting riparian margins with natives

Biodiversity is an essential foundation for maintaining our ecosystem services and is an important part of the future of New Zealand agriculture and the productivity of our land. There are various flaxes and Toi Toi dotted around the place, as well as two ponds. The farm has 24ha of native bush that has a QEII covenant, this borders the Woodlaw Forest. Fawna Farms Ltd will plant the area between the dairy shed and Gap Creek (see figure below) this will increase biodiversity on the property.

11. Pest Management

11.1 Pest Plant Control

Overall there is a low weed burden, with main weeds being gorse and thistles. Fawna Farms Ltd will control the spread of weeds by spraying when required. Chemical containers are recycled using the Agrecovery scheme.

11.2 Pest Animal Control

It is difficult to determine the major pests having only taken over the dairy farm in June, but the proximity to the native bush may mean deer could come into the western part of the property. Fawna Farms Ltd will control pests as required.

12. Farm Dairy Effluent

This section of this plan documents the methods that will be employed in the operation of the Farm Dairy Effluent (FDE) System to ensure that the discharge of effluent occurs in accordance with conditions of the consent. It incorporates Good Management Practices where appropriate as well as site specific mitigation measures.

12.1 Collected Effluent Details

Effluent Collection:	1 x Effluent storage pond with 4590 cubic meters of storage capacity.
Effluent Treatment:	Twin weeping wall
Effluent Distribution:	Effluent abstracted to the travelling irrigator
Effluent Irrigation Type:	Travelling irrigator and low rate pods/ Slurry tanker
Area Irrigated	Current 248.4 ha and proposed 271.4 ha

The purpose of the farm dairy effluent (FDE) System is to capture and apply FDE to land. This is done to maximise the beneficial use of nutrients for plant growth and minimise contamination of groundwater and surface water bodies.

- Capture all FDE
- Spread the FDE at a time that allows uptake by plants
- To uniformly spread the FDE to the desired depth and at the desired application rate
- Control the application within the boundaries of the application area
- To ensure that FDE systems can be operated safely
- To comply with regulatory requirements, including consent conditions.

Table 1: Summary of Fawna Farms Ltd effluent system

Note: the effluent system was inspected by RES Rural Environment Solutions and the assessment "did not note any cracks, holes or defects that would allow leakage from the facility".

Effluent System	Infrastructure
Yard	
Effluent Pond	

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Weeping walls	

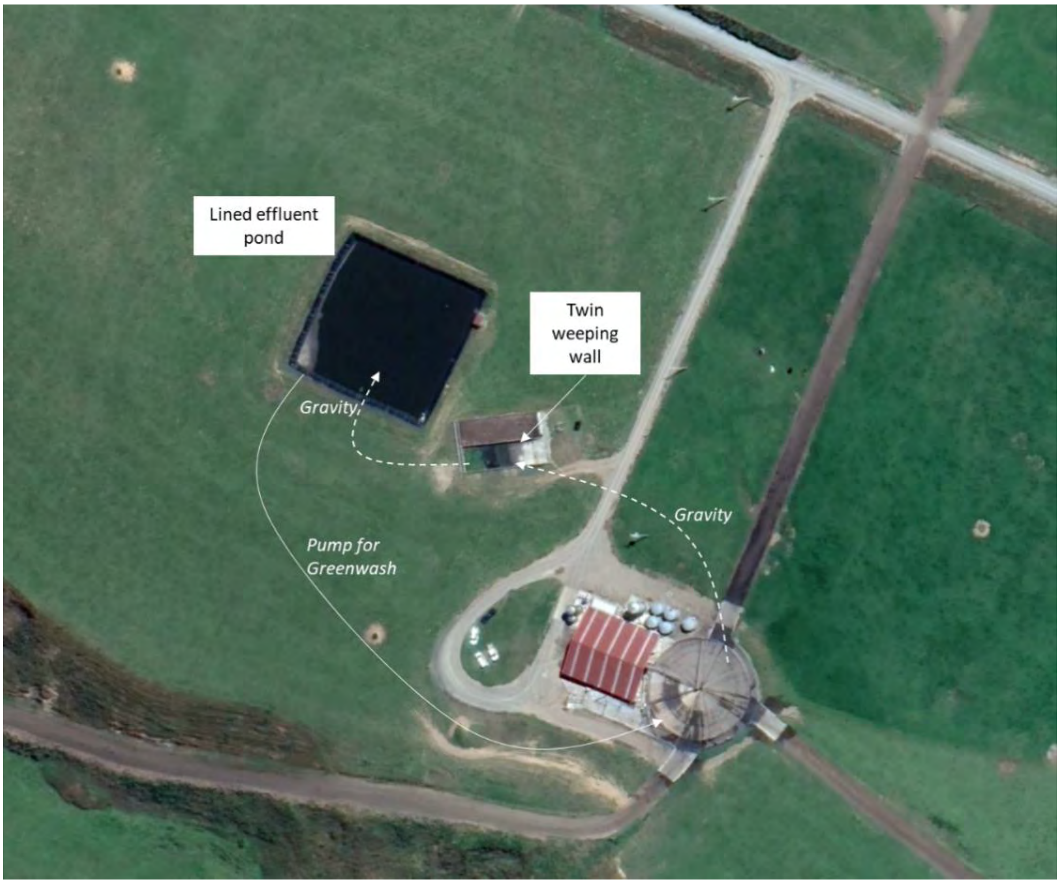

Figure 6: Aerial diagram of effluent system

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12.2 Effluent Collection and Storage Management Plan

Farm Effluent Management Plan Active management of effluent and nutrient budgeting aided by up to date soil moisture monitoring technology will ensure that the risks of leaching are managed and mitigated appropriately. The discharge of FDE to land requires resource consent from Environment Southland, therefore any discharge will be governed by conditions, which must be met at all times.			
Management Objective	**Management Practice**	**Reporting Requirement**	**Responsibility**
Reduction in effluent generation	• Reduce water use in shed by reusing clean water using the greenwash system. • Treat the herd gently to avoid upset	N/A	Farm Manager/ Appropriately Trained Staff
Effluent applied only when soil conditions are appropriate	• When soils are at or above field capacity and/or during adverse weather conditions, effluent is to be stored in the effluent storage pond until conditions are suitable for application. • Monitoring of soil moisture and temperature will be used to determine soil water deficits for sustainable application depths, from data obtained from the ES website. • Checking paddocks before effluent application to confirm soil water deficit exists. • Low rate application will be used at all times. • Sufficient storage to defer irrigation when paddock conditions are unsuitable for receiving effluent.	Effluent disposal records (kept in the shed) Visual observation reporting.	
Avoidance of direct effluent disposal or runoff to sensitive areas	• Effluent discharge will observe a range of buffers from sensitive receiving environments: o 20m all waterways and boundaries; o 100m water bores; and o 200m residential dwelling. • Low rate effluent discharge will avoid ponding and/or runoff. • Effluent applied at rates that do not lead to ponding and/or runoff (i.e., consented rates) • Effluent should not be discharged onto any land areas that have been grazed within the previous 5 days • Effluent disposal to an area of at least 4 ha/100 cows	Mapping of effluent application areas Record irrigation dates, times, areas in the Effluent Movement Check sheet (attachment D)	

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	• Using weather forecasts to predict best times for effluent application, and Beacon soil moisture monitoring (the closest are in Clifden or Wairio at Otatutau Nightcaps road)		
Avoidance of effluent contamination in tile drains	• Identification of tile drains, on the paddock plan (to be drawn on farm map when you know them) • Appropriate application depths over these areas to reduce the associated risk of effluent entering water is avoided.	N/A	
Efficient and effective collection, storage and delivery infrastructure at all times	• Collect all FDE generated at the dairy shed • Maintain and service all parts of the effluent system • Repair leaks immediately and maintain stormwater drains • Effluent irrigation system is capable of delivering the correct amount of effluent for soil type and plant growth	Record all repairs and maintenance Undertake frequent system checks, ensure forms filled out and signed.	Farm Manager/ Appropriately Trained Staff
Regular monitoring of system efficiency	• Monthly/frequently system checks will be undertaken using the Monthly Effluent Check Sheet – Appendix D.	Monthly check sheet records filled out and signed	

Staff appropriately trained in operation and understand the effluent system	• All staff involved in the management of the effluent system are fully trained in its use
	• All staff to be sufficiently trained on farm in effluent management
	• All new staff are introduced to the farming operation and at minimum are introduced to the 'Staff Training Guide' (attached as Attachment D)
	• All staff are familiar with and understand the conditions of consent
	• Opportunities given to existing staff to familiarise themselves with the 'Staff Training Guide' (attached as Attachment D)
	• Staff to take immediate action if incident or breakdowns occur including;
	    ▪ Rectifying the problem
	    ▪ Cleaning up if possible
		Keep signed training record in the back off this Management Plan.
		
		Ensure both farm manager and employee sign to confirm training,
			Farm Manager/ Appropriately Trained Staff

Contingency measures	• Fail safe systems will be kept in place and kept in good working order, i.e., automatic alarm and shut off system.	Monthly Effluent Check Sheet	
Application that is not offensive to neighbours	• Check wind conditions to ensure the effluent can be discharged without resulting in spray drift and odour beyond the property boundary • Observation of buffers to dwellings not located on the property (200 m) and property boundaries (20 m)	Reporting complaints received to Environment Southland.	

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13. Annual Review and Audit of FEMP

This FEMP shall be reviewed on at least an annual basis. The review shall include (but not be limited to) an assessment of:

- Verification of compliance with conditions of consent;
- Details of implementation of GMPs and identification of any new GMPs that would be appropriate to employ on the farm to manage risks identified.
- Review of the data obtained from the monitoring undertaken in accordance with this FEMP and any changes to farming practice required as a consequence;

14. Industry Guidelines

A complete list of the industry guidelines which have been references in the development of this FEMP are listed below. The Consent Holder is also referred to the following general sources for guidance in respect to the operation and management of their property.

Environment Southland www.es.govt.nz

Dairy NZ www.dairynz.co.nz

Fonterra www.fonterra.com

Dairy NZ- A staff guide to operating your effluent irrigation system – Low Rate System

Dairy NZ- A farmer's guide to managing farm dairy effluent – A good practice guide for land application systems

Dairy NZ – Wintering in Southland and South Otago – A land management guide to good environmental practice

Environment Southland Factsheet – Critical Source Areas

APPENDIX

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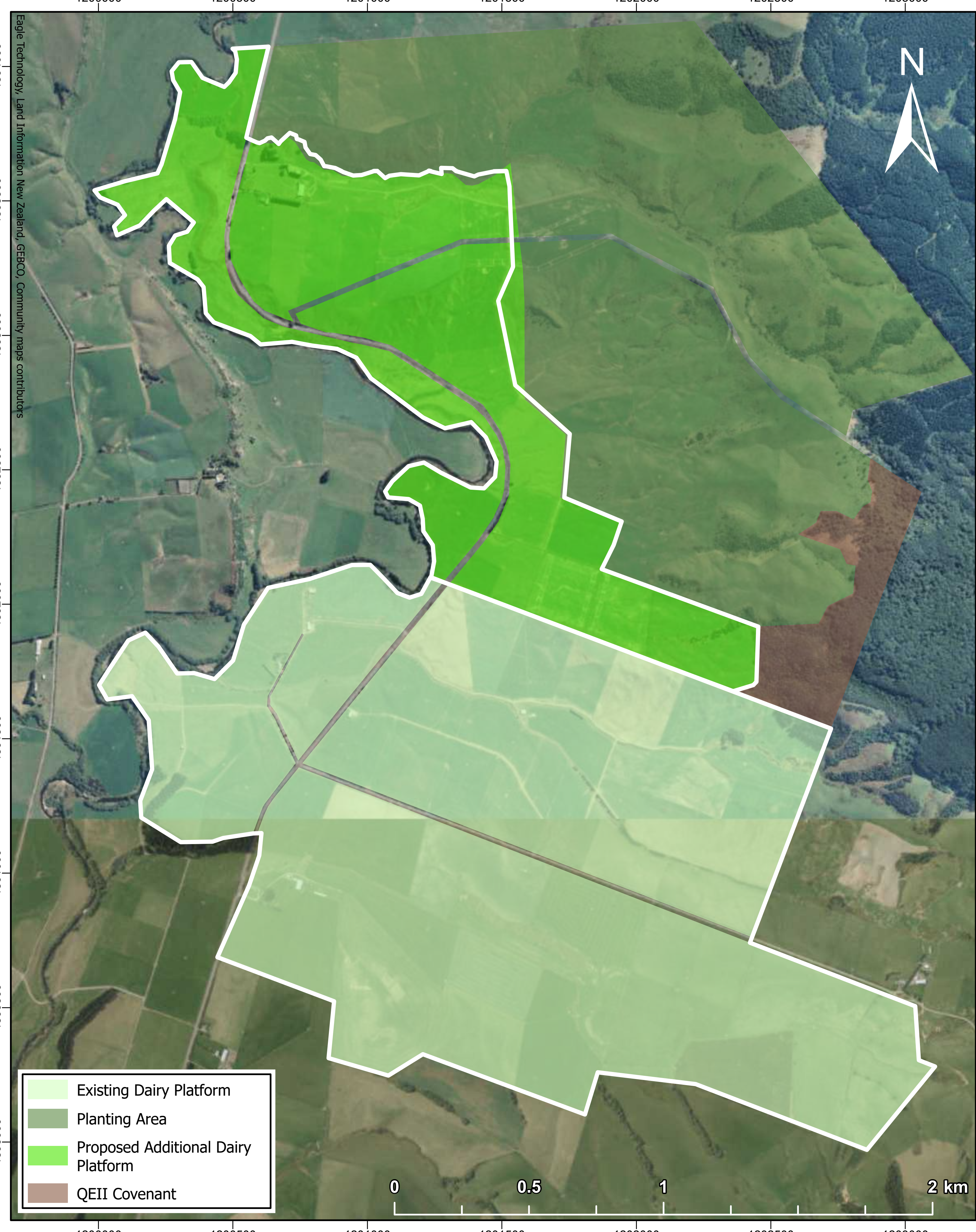
APPENDIX A – FARM MAPS



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Fawna Farms Ltd
Land Management Units

Client: Fawna Farms Ltd

Job Number: 22417

Date: 13/09/2022

Revision: Map 1

APPENDIX B – NUTRIENT BUDGET

Fawna Farms Limited

OverseerFM farm system modelling to support a consent application for expanded dairy

Report prepared for:
Fawna Farms Limited
1620 Clifden Ohai Highway
Otautau 9682

Property Address:
1620 Clifden Ohai Highway
Scott's Gap
Otautau 9682

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30th September 2022

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This report is designed to be read in its entirety and any excerpts should reference the report for completeness of understanding.

Contents

1.0 Executive summary:

Fawna Farms is a 370.9 ha dairy farm and has a consent to peak milk 900 dairy cows.

A neighbouring and adjoining 454.6 ha farm has been purchased by IFS Growth – a forestry management and investment company. The IFS Growth property is currently operated as a dairy support, sheep and beef trading property.

The IFS Growth property is of flat, rolling, and easy hill topographies. An assessment has been undertaken to identify the environmental risk areas on the IFS Growth property and the best long term sustainable use of the property. From the environmental risk assessment, it is proposed that:

1. IFS Growth retire the steeper contour land from pastoral farming and establish a 288.7 ha forestry block
2. Fawna Farms purchase the remaining 165.9 ha from IFS Growth to expand their dairy farm

The proposed dairy expansion by Fawna Farms requires a land use consent for expanded dairying.

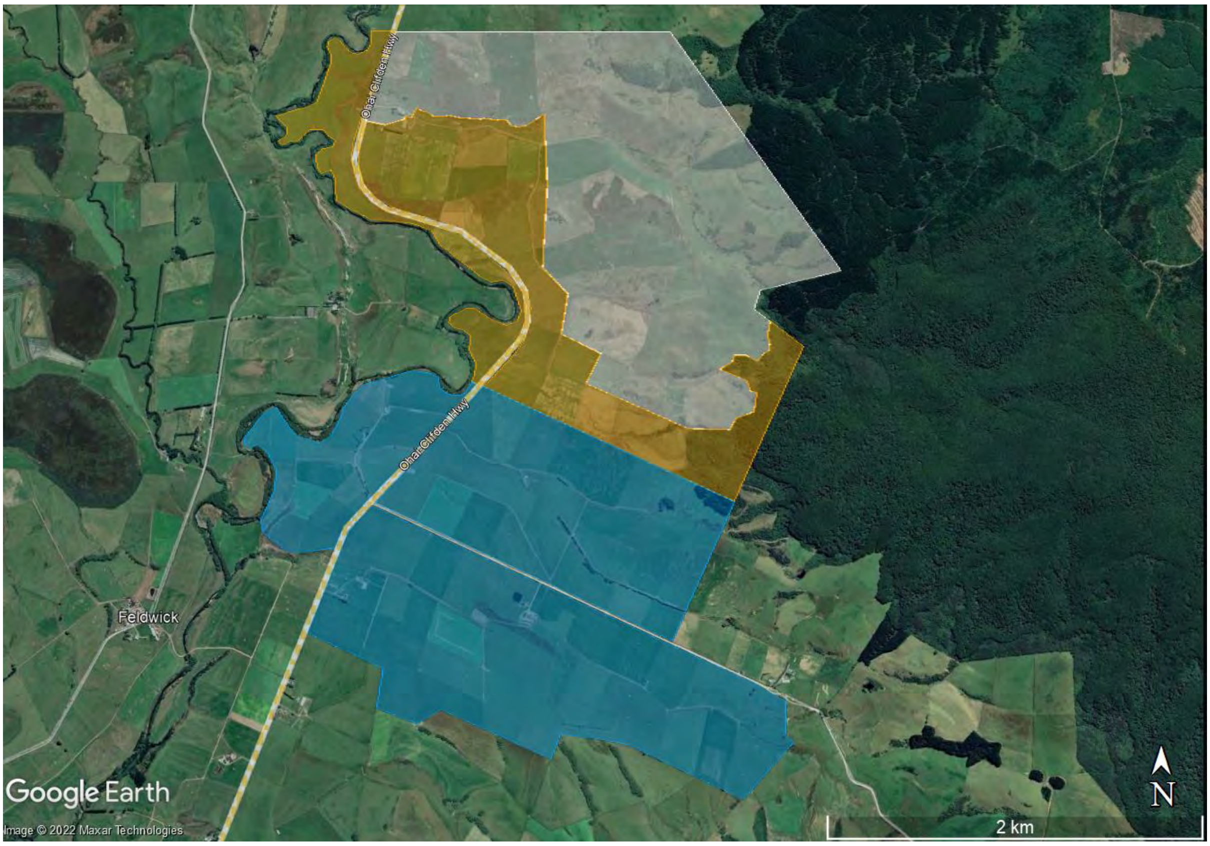


Figure 1.The map above shows the area currently owned by Fawna Farms (Blue) and IFS Growth (white and orange). It is proposed to incorporate the orange area into the Fawna Farms property and the white area will be converted into forestry by IFS Growth

The proposed Fawna Farms dairy expansion includes increasing the dairy farm by 165.9 ha (an increase from 370.9 ha to 536.8 ha) and will enable the farm to be self-contained for dairy cow wintering. It is proposed to increase the peak herd number from 900 to 1200 cows.

The proposed IFS Growth 288.7 ha forestry block will not only retire land from pastoral farming but also remove current winter cropping on the steeper and therefore higher risk portion of the property.

Current Fawna Farms

The Fawna Farms dairy farm is 370.9ha and is made up of a mix of rolling and flat topographies. The property has a current effluent discharge consent that allows a maximum of 900 cows milking. In the Year End 2020 period, under a previous owner's management, the property peak milked 870 cows producing 418,777kgMS (481kgMS/cow). Replacement calves were grazed on farm until May, and in calf heifers returned to the platform in May. In the 2019 winter, 20ha of swedes were grazed, while 21.4ha were sown for the 2020 winter. The maximum crop area grazed in the 2014 to 2019 reference period was 24.7ha. Soil tests taken in 2019 show that the Olsen P was 33.

Current IFS Growth

The property has been managed as a dairy support, sheep, and beef trading operation. At the end of the Year Ending 2020 period, under the previous owner's management, the property was running 210 dairy calves, 530 MA dairy cows, 89 Wagyu R3s, 218 Jersey and Belted Galloway mature bulls, 160 R1 dairy cross steers and heifers, and approximately 300 sheep. In the 2019 winter, 33.7ha of crop was grazed, while 29.2ha was sown for the 2020 winter. The maximum crop area grazed in the 2014 to 2019 reference period was 33.7 ha. Soil tests taken in 2018 show that the Olsen P was 32.

Proposed Fawna Farms

It is proposed that Fawna Farms Limited purchase 165.9ha of flat and rolling land of the IFS Growth property. This area would then be incorporated into the dairy platform to increase cow numbers to 1,200 at peak. Production would increase to 480,000kgMS. Young stock would be grazed off farm from weaning and will return as in calf heifers 18 months later. All cows would be wintered on farm on 53.7ha of swedes, supplemented with baleage.

Proposed IFS Growth

Of the remaining 288.7 ha owned by IFS Growth, 245.5ha will be planted in pine trees. A further 29.6ha of native bush and QE2 area would be left undisturbed.

Nutrient budgeting

Nutrient budgeting has been completed using OverseerFM version 6.4.3 to support a consent application for expanded dairy. These budgets estimate the nitrogen and phosphorus losses from the landholding in the Year Ending 2020 period and the proposed farm systems:

- Year Ending 2020
  The losses from the Year End 2020 is the sum of losses from Fawna Farms dairy farm and the IFS Growth dairy support, beef trading and sheep property.
- The proposed system
  The losses from the proposed system is the sum of the losses from the expanded Fawna Farms dairy farm and the IFS Growth forestry block.

1.1 Nutrient budgeting output summary

The tables below show the outputs from OverseerFM for modelling of the Year End 2020 and Proposed farm systems.

Table 1. Estimated nutrient losses from the Year End 2020 landuse on the Fawna Farms dairy farm and the IFS Growth mixed enterprise property as estimated by OverseerFM version 6.4.3.

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Total YE2020**
Area (ha)	370.9	454.6	825.5
Total Farm N Loss (kg)	17,607	14,099	31,706
N Loss/ha (kgN/ha/yr)	47	31	38
Total Farm P Loss (kg)	401	668	1069
P loss/ha (kgP/ha/yr)	1.1	1.5	1.3
Pasture Grown (tDM/ha)	16.1	10.4 (flat and rolling) 6.2 (easy hill)	
Total Revised Stock Units (RSU)	9,872	4,799	14,671

Table 2. Estimated nutrient losses from the proposed landuse on the Fawna Farms dairy farm and the IFS Growth forestry block as estimated by OverseerFM version 6.4.3.

	Fawna Farms Proposed Dairy Farm	**IFS Growth Proposed** Forestry	**Total Proposed**
Area (ha)	536.8	288.7	825.5
Total Farm N Loss (kg)	28,835	730	29565
N Loss/ha (kgN/ha/yr)	54	3	36
Total Farm P Loss (kg)	613	35	648
P loss/ha (kgP/ha/yr)	1.1	0.1	0.8
Pasture Grown (tDM/ha)	15.9	NA	
Total Revised Stock Units (RSU)	12,598	0	12,598

Note: Estimated pasture grown figures are higher than expected for the dairy farms. This is discussed in section 4.1

Table 3. Comparison of the estimated nutrient losses for the Year End 2020 and the proposed system as estimated by OverseerFM version 6.4.3.

	Total YE2020	Total Proposed	Estimated change
Area (ha)	825.5	825.5	
Total Farm N Loss (kg)	31,706	29,565	Reduction of 2141 kgN 6.8% decrease
N Loss/ha (kgN/ha/yr)	38	36	
Total Farm P Loss (kg)	1,069	648	Reduction of 421 kgP 39.4% decrease
P loss/ha (kgP/ha/yr)	1.3	0.8	
Total Revised Stock Units (RSU)	14,671	12,598	Reduction of 2,073 RSU 14.1% decrease

1.2 Drivers of changes in nutrient losses

1.2.1 Nitrogen loss estimates

Nitrogen losses from a farm system can have negative impacts on water quality downstream. This in turn can have negative implications on aquatic life and human health. The use of OverseerFM has estimated a 6.8% decrease in nitrogen losses between the current and proposed scenarios. This is the cumulative result of many changes to the farm system including:

Decrease in nitrogen loss risk:

- A reduction in grazed area due to conversion to forestry
- A reduction in nitrogen fertiliser use on the winter crops
- Reduction in RSU
- RSU / ha decreasing on the original dairy area
- Increase in effluent area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed

Increase in nitrogen loss risk:

- Increase in productivity of the area converted to dairy
- Increase in total nitrogen fertiliser used

1.2.2 Phosphorus loss estimates

Phosphorus losses from farms can cause algal growth in surface waterways. The use of OverseerFM has estimated a 39.4% decrease in Phosphorus losses in the proposed system. This is the cumulative result of many changes to the farm system including:

- A reduction in grazed area due to conversion to forestry. This results in less soil disturbance by hooves and greater vegetative cover which will slow down water as it runs off land
- Decrease in Phosphorus fertiliser use
- Decrease in RSU
- Removal of sheep and beef and third-party dairy grazing operation
- Fencing off streams

2.0 Report purpose

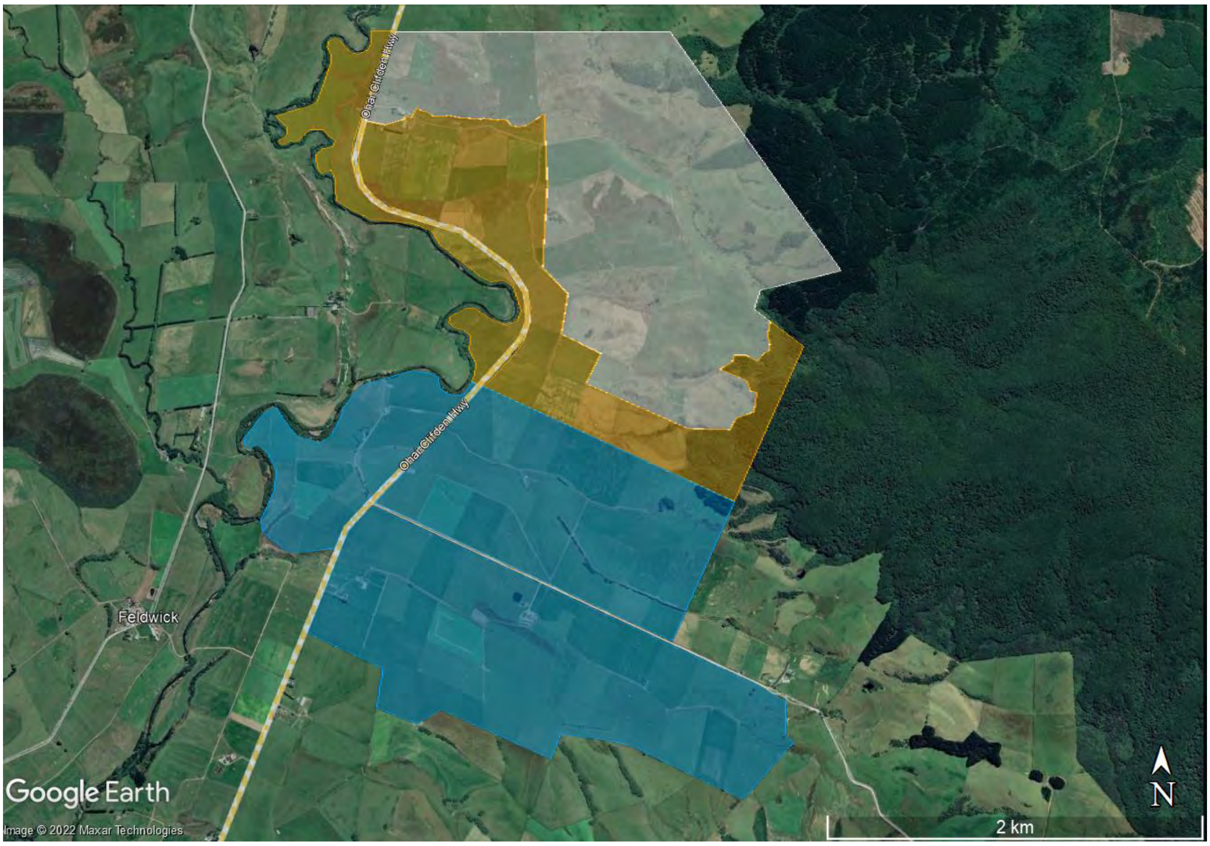
The results of the budgets will be utilised to support a land use consent application for expanded dairying. This report will emphasise the relevant requirements in the proposed Southland Water and Land Plan, and the National Environmental Standards from a nutrient budgeting perspective. The broader range of requirements should be captured in the Farm Environmental Management Plan (FEMP). This report will inform the FEMP which will be completed separately.
Potential environmental risks on the property have been considered and should be included in the FEMP. These include:

- Contamination of ground water
- Contamination of surface water
- Undesired changes in soil nutrient status
- Nutrient application to non-target land
- Accumulation of non-nutrient impurities in the soil profile
- Excess stocking rate
- Pugging and compaction
- Poor cultivation methods

3.0 Farm overview

3.1 Landholding location and ownership

The landholding is located at Feldwick, northwest of Otautau and south of Ohai. It is owned in two separate properties by Fawna Farms and IFS Growth. The map below shows the area currently owned by Fawna Farms (blue) and IFS Growth (white and orange). It is proposed to incorporate the orange area into the Fawna Farms property and the white area will be converted into forestry by IFS Growth.



3.2 Landholding particulars:

	Fawna Farms Limited
Property Addresses	Fawna Farms Limited 1620 Clifden Ohai Highway Scott's Gap Otautau 9682 IFS Growth Limited 1315 Ohai Clifden Highway Feldwick Otautau 9682
Legal Description	Fawna Farms Limited • Section 16 and 18 Merrivale Settlement No 2

	• Section 94 and part sections 29 and 94R Block IX Waiau Survey District • Section 1 Survey Office Plan 452868 • Lot 3 Deposited Plan 340527 IFS Growth Limited • Lot 1-7 Deposited Plan 7360 • Section 250 Block IX Waiau Survey District Please note: a subdivision consent application is occurring alongside the dairy expansion consent application. At the time of writing, the land being sold to Fawna Farms did not have a title.
Area	**Current:** Fawna Farms Limited: 370.9ha IFS Growth Limited 454.6ha Total landholding 825.5ha **Proposed (following subdivision):** Fawna Farms Limited: 536.8ha IFS Growth Limited: 288.7ha Total landholding: 825.5ha

3.4 Farm system overview

A detailed description of the modelling methodology and Overseer input data is given in the appendices of this report. This section gives an overview of the farm system modelled in each budget.

3.4.1 Fawna Farms YE20

A nutrient budget was completed for the Year Ending 2020. As Fawna Farms did not own the property in the YE20 period, the information was collected from the previous owners. The information is of a good standard. Where possible the information collected has been verified against Google Earth and the previous owners purchase/sale records.

Stock and production:

- 870 Friesian Jersey cross cows were milked at peak
- Production of 418,777kgMS (481kgMS/cow)
- 230 dairy calves were reared on farm and grazed on farm until the 1st May.
- 220 In calf heifers returned from the runoff on the 1st May and were wintered on farm

Feed

- Imported feed was:
  - PKE – 258.2t fed in shed
  - DDG – 264.8t fed in shed
  - Baleage – 132tDM fed to dairy cows

- Winter crop sown:
  - 2019 winter – 20.0ha of swedes
  - 2020 winter - 21.4ha of swedes

Fertiliser

- Soil tests were taken in June 2019. These showed good soil fertility levels across the property. The Olsen P was 33.
- Fertiliser purchase records have been used to enter actual fertiliser use into Overseer.
- Pastoral nitrogen fertiliser use was 219kgN/ha applied in split dressings from August to April.

Structures

- Dairy effluent was separated using a weeping wall. Liquids were applied using a travelling irrigator to 67.1ha of the hydranted effluent area. Solids were applied to paddocks across the entire platform when conditions were favourable.

3.4.2 IFS Growth YE20

A nutrient budget was completed for the Year Ending 2020. As IFS Growth did not own the property in the YE20 period, the information was collected from the previous owners. The information is of a fair standard. Where possible the information collected has been verified against Google Earth and the previous owners purchase/sale records. Where detailed information was not available, conservative assumptions have been made using industry standards.

Stock and production:

The property was operated as a mixed dairy support, beef trading and sheep breeding/finishing farm. A full description of the stock classes and stock numbers is given in the appendices of this report. Year-end 2020 stock numbers on farm were:

- Dairy Support
  - 210 dairy R1 heifers
  - 530 MA dairy cows
- Beef Trading
  - 89 Wagyu R3s
  - 218 Jersey and Belted Galloway mature bulls
  - 160 R1 dairy cross steers and heifers
- Sheep
  - 250 hoggets
  - 40 lambs
  - 35 ewes

Feed

- No imported feed
- Winter crop sown:

- 2019 winter – 33.7ha of swedes and fodder beet
- 2020 winter – 29.2ha of swedes and fodder beet

Fertiliser

- Soil tests were taken in August 2018. These showed good soil fertility levels across the property. The Olsen P was 32.
- Fertiliser purchase records have been used to enter actual fertiliser use into Overseer.
- Pastoral nitrogen fertiliser use was 17kgN/ha on the flat and rolling areas, and 6kg/ha on the Easy Hill area.

3.4.3 Fawna Farms Proposed Dairy System

Fawna Farms propose to operate a lower input, lower per cow production system than that operated in the YE20 by the previous owners which is consistent with how they have historically operated other properties. The expansion of the dairy farm will allow the farm to milk 1200 cows at peak, winter all cows on farm and grow a significant proportion of their winter baleage requirements.

Following the expansion of the dairy platform, Fawna Farms will operate the following system:

Stock and production:

- 1200 Friesian Jersey cross cows milked at peak
- Production of 480,000kgMS (400kgMS/cow)
- 300 dairy calves will be reared on farm. They will be grazed off farm from the 1st Dec
- 285 Incalf heifers will return to the platform on the 1st May
- All cows will be wintered on farm

Feed

- Imported feed is expected to be:
    - PKE – 150TDM fed in shed
    - DDG – 150TDM fed in shed
- Winter crop sown:
    - 53.7ha of Swedes

Fertiliser

- Soil fertility will decrease slightly to a 32 Olsen P. This Olsen P is slightly above the agronomic optimum to support the high pasture growth required within the system.
- Maintenance fertiliser rates have been entered into Overseer.
- Pastoral nitrogen fertiliser will be 189kgN/ha applied in split dressings from August to April.

Structures

- Dairy effluent will continue to be separated using a weeping wall. The liquid effluent application area will be increased to cover the entire hydranted area of 176.2ha. Solids will be applied to paddocks across the entire platform when conditions are favourable.

3.4.4 IFS Growth Forestry Block

All stock will be removed from the IFS Growth property. Pine trees will be planted on approximately 245.5ha of the property. A further 29.6ha of native bush and QE2 area will be left undisturbed.

Please Note:

For the YE20 budgets, baleage and silage supplements have been distributed to enterprise without time of year specified. This is because distributing the supplements to a block (crops and pastoral) resulted in an error message. This error is believed to be a result of Overseer underestimating the feed requirements and overestimating the feed utilisation in Southland crop wintering scenarios. To ensure an "apples with apples" approach, baleage and silage in the proposed dairy farm nutrient budget has also been distributed to enterprise without time of year specified.

4.0 OverseerFM nutrient loss estimates

The tables below show the outputs from OverseerFM for modelling of the Year End 2020 and Proposed farm systems.

Table 4. Estimated nutrient losses from the Year End 2020 landuse on the Fawna Farms dairy farm and the IFS Growth mixed enterprise property as estimated by OverseerFM version 6.4.3.

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Total YE2020**
Area (ha)	370.9	454.6	825.5
Total Farm N Loss (kg)	17,607	14,099	31,706
N Loss/ha (kgN/ha/yr)	47	31	38
Total Farm P Loss (kg)	401	668	1069
P loss/ha (kgP/ha/yr)	1.1	1.5	1.3
Pasture Grown (tDM/ha)	16.1	10.4 (flat and rolling) 6.2 (easy hill)	
Total Revised Stock Units (RSU)	9,872	4,799	14,671

Table 5. Estimated nutrient losses from the proposed landuse on the Fawna Farms dairy farm and the IFS Growth forestry block as estimated by OverseerFM version 6.4.3.

	Fawna Farms Proposed Dairy Farm	**IFS Growth Proposed** Forestry	**Total Proposed**
Area (ha)	536.8	288.7	825.5
Total Farm N Loss (kg)	28,835	730	29565
N Loss/ha (kgN/ha/yr)	54	3	36
Total Farm P Loss (kg)	613	35	648
P loss/ha (kgP/ha/yr)	1.1	0.1	0.8
Pasture Grown (tDM/ha)	15.9	NA	
Total Revised Stock Units (RSU)	12,598	0	12,598

Note: Estimated pasture grown figures are higher than expected for the dairy farms. This is discussed in section 4.1

Table 6. Comparison of the estimated nutrient losses for the Year End 2020 and the proposed system as estimated by OverseerFM version 6.4.3.

	Total YE2020	Total Proposed	Estimated change
Area (ha)	825.5	825.5	
Total Farm N Loss (kg)	31,706	29565	Reduction of 2141 kgN 6.8% decrease
N Loss/ha (kgN/ha/yr)	38	36	
Total Farm P Loss (kg)	1069	648	Reduction of 421 kgP 39.4% decrease
P loss/ha (kgP/ha/yr)	1.3	0.8	
Total Revised Stock Units (RSU)	14,671	12,598	Reduction of 2,073 RSU 14.1% decrease

4.1 Notes for interpretation of OverseerFM outputs

Estimated pasture grown

It should be noted that the estimated pasture grown outputs from Overseer are higher than expected for the dairy scenarios. Overseer uses a default value for ryegrass/white clover pasture quality irrespective of the land use and management. The default Overseer value in Southland ranges from 10.5 to 11.17 MJ ME/ kg DM depending on the month (reference: Characteristics of pasture, June 2018, D M Wheeler AgResearch Ltd). Pasture cuts from an Eastern Southland monitor farm show MEs of 11.5 to 12.2 (reference: Pasture growth and quality on Southland and Otago dairy farms, D. E. Dalley and T. Geddes, DairyNZ, NZ Grasslands Publication 2012).

The Overseer default values have been used throughout the entirety of this modelling as the Best Practice Data Input Standards state that "*there needs to be a very good long-term average evidence of clover content, pasture utilisation, pasture N content and pasture quality to justify changes from the default OVERSEER values. This level of information would be rare."*

To ensure that comparisons are valid between the baseline and proposed the same method has been used to ensure that an "apples with apples" approach is taken.

Regarding the area that will be added to the Fawna Farms dairy platform, it is estimated that this area will achieve similar pasture production to the current dairy farm area. This is due to a change in farm system (sheep, dairy grazing and beef trading to dairy) and a result of factors such as re-grassing, rotational grazing and higher nitrogen fertiliser use. This also has a corresponding increase in biological fixation.

5.0 Conclusions

Modelling of the Year End 2020 landuse has been compared to the proposed landuse going forward using OverseerFM version 6.4.3. The modelling has estimated that the proposed system will have 6.8% lower losses of nitrogen and 39.4% lower losses of phosphorus.

5.1 Drivers of changes in nutrient losses

5.1.1 Nitrogen loss estimates

Nitrogen losses from a farm system can have negative impacts on water quality downstream. This in turn can have negative implications on aquatic life and human health. The use of OverseerFM has estimated a 6.8% decrease in nitrogen losses between the current and proposed scenarios. This is the cumulative result of many changes to the farm system including:

Decrease in nitrogen loss risk:

- A reduction in grazed area due to conversion to forestry
- A reduction in nitrogen fertiliser use on the winter crops
- Reduction in RSU
- RSU / ha decreasing on the original dairy area
- Increase in effluent area
- Removal of sheep and beef and third-party dairy grazing operation
- Decrease in imported feed

Increase in nitrogen loss risk:

- Increase in productivity of the area converted to dairy
- Increase in total nitrogen fertiliser used

5.1.2 Phosphorus loss estimates

Phosphorus losses from farms can cause algal growth in surface waterways. The use of OverseerFM has estimated a 39.4% decrease in Phosphorus losses in the proposed system. This is the cumulative result of many changes to the farm system including:

- A reduction in grazed area due to conversion to forestry. This results in less soil disturbance by hooves and greater vegetative cover which will slow down water as it runs off land
- Decrease in Phosphorus fertiliser use
- Decrease in RSU
- Removal of sheep and beef and third party dairy grazing operation
- Fencing off streams

5.2 Recommendations from here

OverseerFM can model a specific range of good management practices. Below is a summary of the potential environmental risks on this property and gives recommendations to mitigate these risks.

Good practice for fertiliser use:

- Regular soil testing is used to inform fertiliser recommendations that target agronomic optimum P, K, S, Mg and Ca levels.
- Develop a fertiliser plan with your fertiliser representative. Recommend you make this OverseerFM modelling available to your fertiliser representative to assist them in developing the fertiliser recommendations.
- Apply using a Spreadmark accredited company for fertiliser application – apply at correct rate and with a buffer to waterways.
- Use of Fertmark registered products.
- Record fertiliser applications (location, date of application and amount applied).

Nitrogen:

- Apply nitrogen strategically to meet plant demand.
- Applications should generally be avoided in May due to rapidly declining growth rates.
- Spring nitrogen applications should not be on soil less than 7 degrees Celsius.

Phosphorus:

- OverseerFM is not spatially explicit and a phosphorus mitigation plan should be developed to reduce phosphorus losses.

Critical source areas:

- These include laneways, gateways, swales in paddocks and wallows.
- Review your Farm Environmental Management Plan to update as required and take action on mitigating risk on any new critical source areas identified.

The Proposed Water and Land Plan is currently in the appeals process and is partially operative. It will be important to stay up to date with developments in Environment Southland policy and rules, including the limit setting process which will develop over the next few years.

A National Environmental Standard (NES) has been gazetted. This has implications for the wintering of stock on crop, stock exclusion from waterways, nitrogen fertiliser use, changes in landuse and the use of stockholding areas for cattle.

Both the Proposed Water and Land Plan and the National Environmental Standards require a farm of this size to have a farm environmental management plan. This should be updated to include the recommendations within this report.

Appendices

Appendix 1. Modelling Methodology

Nutrient losses have been estimated using the OverseerFM Version 6.4.3 model. OverseerFM is a software application that models nutrient movements within a farm system. Input data detailing the farm system is entered into the software and interpreted through the use of a series of sub-model that calculate the flow of seven major farm nutrients (Nitrogen, Phosphorus, Sulphur, Calcium, Magnesium and Sodium). Output data is reported for interpretation and to inform farm management practices. It currently requires an expert user to describe the physical and management details of a farm.

OverseerFM assumptions

Within the OverseerFM software, assumptions have been made of the farm management:

- Long term annual average model
  The model uses annual average input and produces annual average outputs.
- Near equilibrium conditions
  Model assumes that that the farm is at a state where there is minimal change each year.
- Actual and reasonable inputs
  It is assumed that input data is reasonable and a reflection of the actual farm system. If any parameter changes, it is assumed that all other parameters affected will also be changed.
- Good management practices are followed
  OverseerFM assumes the property is managed at industry agreed good management practice for a specific list of factors including effluent and fertiliser applications. OverseerFM does not assume that all industry agreed good management practices are undertaken on farm.

OverseerFM limitations

Key limitations of the OverseerFM model are:

- OverseerFM does not predict transformations, attenuation or dilution of nutrients between the root zone or farm boundary and the eventual receiving water body. A catchment model is needed to estimate the effects of the nutrient losses from farms on groundwater, river or lake water quality.
- OverseerFM does not calculate outcomes from extreme events (floods and droughts) but provides a typical years result based on a long-term average.
- OverseerFM does not calculate the impacts of a conversion process, rather it predicts the long-term annual average nutrient budgets for changed land use.
- OverseerFM is not spatially explicit beyond the level of defined blocks.
- Not all management practices or activities that have an impact on nutrient losses are captured in the OverseerFM model.
- OverseerFM does not represent all farm systems in New Zealand.
- Components of OverseerFM have not been calibrated against measured data from every combination of farm systems and environment.

Information on OverseerFM can be obtained from the following reports:

- Technical Description of OVERSEER for Regional Councils, September 2015
- Review of the phosphorus loss submodel in OVERSEER®, September 2016
- Using OVERSEER® in Regulation – Technical Resources and Guidance for Regional Councils, August 2016

Data input standards

Nutrient budgets have been constructed using the OverseerFM Version 6.4.3 model.

The nutrient budgets have been developed in accordance with the Overseer data input protocols - "Overseer, Best Practice Data Input Standards, March 2018" and the "OverseerFM User Guide, October 2019." No deviations have been made from these protocols.

Appendix 2. Modelling Inputs

Soil types

Soil type has a large bearing on nutrient loss levels from a property. This is due to different soil types having different water holding capacities, and drainage characteristics. It is therefore important that soil type is inputted correctly.

The table below gives a brief description of the soil types found on the landholding:

S-map ref	Soil Order and Group	Drainage class	Description
Auchr_9b.1	Pallic, Recent/YGE/BGE	Poor	deep, poorly drained, clay
Hedge_4a.1	Brown, Sedimentary	Moderately well	deep, moderately well drained, silt
Malok_3a.1	Melanic, Sedimentary	Well	deep, well drained, silt over clay
Apar_6a.1	Brown, Sedimentary	Imperfect	deep, imperfectly drained, silt
Eure_22a.1	Gley, Sedimentary	Poor	deep, poorly drained, silt
Tuap_6b.2	Melanic, Sedimentary	Well	deep, well drained, silt
Waiau_3a.1	Recent, Recent/YGE/BGE	Well	shallow, well drained, sand
Makar_3b.1	Gley, Sedimentary	Poor	deep, poorly drained, clay
Ihak_23a.1	Brown, Sedimentary	Moderately well	deep, moderately well drained, silt over clay

The table below shows the area of the block that the soils identified cover:

S-map ref/name	Total area
Auchr_9b.1	376.3 ha
Hedge_4a.1	174.2 ha
Apar_6a.1	66.6 ha
Malok_3a.1	66.2 ha
Eure_22a.1	20.1 ha
Tuap_6b.2	19.6 ha
Waiau_3a.1	11.6 ha
Makar_3b.1	11.4 ha
Ihak_23a.1	10.9ha

Climate Data

The following climate information has been estimated by the OverseerFM climate station tool:

	Fawna Farms YE2020 Dairy Farm	**IFS Growth YE2020** Mixed Enterprise	**Fawna Farms Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
Annual Rainfall (mm)	958-970	958-990	958-977	965-978
Mean Annual Temp (°C)	10.1 – 10.4	9.6-10.4	9.6-10.3	9.6-10.1
Annual PET (mm)	673-693	647-690	647-688	650-676

Blocks

The farms have been split into the following pastoral, riparian and fodder crop blocks based on soil type, contour, drainage and land use.

	Fawna Farms YE2020 Dairy Farm	IFS Growth YE2020 Mixed Enterprise	Fawna Farms Proposed Dairy Farm	IFS Growth Proposed Forestry
	Area (ha)			
Pasture blocks				
Non Effluent - Flat	143.4		71.9	
Non Effluent - Rolling	70.5		57.9	
West of Road - Flat	49.9		59.3	
Fawna Farms - Flat		90.9	114.9	
Fawna Farms – Rolling		26.0	26.0	
IFS Growth – Easy Hill		75.9		
IFS Growth – Flat		20.1		
IFS Growth - Rolling		128.7		
Effluent - Flat	67.1		156.6	
Effluent - Rolling			19.6	
Crop blocks				
Swedes ('19 and '20) west of road	7.0			
Swedes ('19) non effluent flat	6.0			
Swedes ('19) non effluent rolling	7.0			
Swedes ('20) non effluent flat	12.0			
Swedes ('20) west of road	2.4			
FB ' 20 (Fawna flat)		4.1		
FB '19 (Fawna flat)		9.3		
FB '19 (IFS rolling)		7.0		
FB '19 - FB '20 (Fawna flats)		5.7		
FB '19 - swede '20 (Fawna flat)		0.4		
FB '19 - swede '20 (IFS flat)		6.8		
FB '20 (IFS flat)		12.2		
Swedes '19 (Fawna flat)		4.5		
Forestry				
Pine planting				245.5
Productive Block Area	**365.3**	**391.6**	**506.2**	**245.5**
QE2 covenant area		31.5	24.1	7.4
Native Bush		22.2		22.2
Setbacks				5.2
Non-effective area	5.6	9.3	6.5	8.4
Total area	**370.9**	**454.6**	**536.8**	**288.7**
Rotating fodder crops				
Swedes			53.7	

Pasture & Crops

	Fawna Farms **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth Proposed** Forestry
Drainage	50% drained by mole/tiles	Flats and Rolling blocks 50% drained by tiles/moles	50% drained by mole/tiles	NA
Pasture Distribution	No difference between blocks	Easy Hill blocks have 60% of the pasture yield of the flat/rolling blocks	No difference between blocks	NA
Crops	2019 = 20ha swedes 2020 = 21.4ha swedes Swedes Sown in December (conventional cultivation) Yield 12TDM/ha Grazed June – Sep by dairy cows and replacements 220kg/ha DAP at sowing 100kg/ha Sustain Feb	2019 = 33.7ha 2020 = 29.2ha Fodder Beet Sown in December (conventional cultivation) Yield 20TDM/ha Grazed from Jun – Sep by beef and dairy grazing stock 417kg/ha Fodder beet base at sowing 169kg/ha sustain in Feb Swedes Sown in December (conventional cultivation) Yield 12TDM/ha Grazed June – Sep by beef and dairy grazing stock 417kg/ha Fodder Beet Base at sowing 169kg/ha Sustain in Feb Paddocks that were resown in pasture following the 2019 winter were fertilised with 174kg/ha DAP at sowing.	Swedes 53.7ha rotating through the entire farm Sown in December (Conventional Cultivation) Yield 12tDM/ha Grazed in May by replacements Grazed in June – August by MA cows and replacements 250kg/ha DAP at sowing 100kg/ha Urea in Feb	NA

Animals

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
Milk solids production	418,777 kgMS (481kg/cow) Median calving date – 25 Aug Drying off – 26 May	None	480,000 kgMS (400kgMS/cow – note change in farm ownership and farm system compared to the YE2020) Median calving date – 25 Aug Drying off – 26 May	NA
Dairy cows on farm	Breed FJx July 320 Aug 900 Sept 885 Oct 870 Nov 870 Dec 870 Jan 870 Feb 870 March 850 April 810 May 680 June 50 18 breeding bulls (2yr old jersey) – 20th Oct – 1st Feb	Breed FJx July 530 Aug 530 (until 7th) June 530	Breed FJx July 1240 Aug 1240 Sept 1220 Oct 1200 Nov 1200 Dec 1200 Jan 1200 Feb 1200 March 1172 April 1117 May 1060 June 955 25 breeding bulls (2yr old jersey) – 20th Oct – 1st Feb	NA

<table>
<tr><th>Description</th><th>Fawna Farms
YE2020
Dairy Farm</th><th>IFS Growth
YE2020
Mixed Enterprise</th><th>Fawna Farms
Proposed
Dairy Farm</th><th>IFS Growth
Proposed
Forestry</th></tr>
<tr><td>Dairy replacements</td><td>230 replacements on until May 1st

Incalf R2s return 1st May (220)</td><td>FJx dairy replacements

<table>
<tr><th></th><th>Calves</th><th>Heifers</th></tr>
<tr><td>Jul</td><td></td><td>165</td></tr>
<tr><td>Aug</td><td></td><td>165</td></tr>
<tr><td>Sep</td><td></td><td>165</td></tr>
<tr><td>Oct</td><td></td><td>165</td></tr>
<tr><td>Nov</td><td></td><td>165</td></tr>
<tr><td>Dec</td><td></td><td>165</td></tr>
<tr><td>Jan</td><td>210</td><td>165</td></tr>
<tr><td>Feb</td><td>210</td><td>140</td></tr>
<tr><td>Mar</td><td>210</td><td>140</td></tr>
<tr><td>Apr</td><td>210</td><td>140</td></tr>
<tr><td>May</td><td>210</td><td>140</td></tr>
<tr><td>Jun</td><td>210</td><td></td></tr>
</table>
</td><td>300 raised – leave on 1st Dec

285 incalf heifers return 1st May</td><td>NA</td></tr>
<tr><td>Beef</td><td>30 beef cross calves reared. 20 sold 1st Dec, rest taken through to Feb as R2s</td><td>Beef Trading stock were run on the property

Stock had access to streams

<table>
<tr><th></th><th>R2 Wagyu Steers</th><th>R2 Jersey Sire Bulls</th><th>R2 Belted Galloway Bulls</th><th>R3 Jersey Sire Bulls</th><th>R3 Belted Galloway Bulls</th></tr>
<tr><td>Jul</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
<tr><td>Aug</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
<tr><td>Sep</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
<tr><td>Oct</td><td>89</td><td>30</td><td></td><td>178</td><td>40</td></tr>
</table>
</td><td>None</td><td>NA</td></tr>
</table>

<table>
<tr><th>Description</th><th>Fawna Farms
YE2020
Dairy Farm</th><th>IFS Growth
YE2020
Mixed Enterprise</th><th>Fawna Farms
Proposed
Dairy Farm</th><th>IFS Growth
Proposed
Forestry</th></tr>
<tr><td></td><td></td><td><table>
<tr><td>Nov</td><td>89</td><td>30</td><td></td><td></td><td>40</td></tr>
<tr><td>Dec</td><td>89</td><td>30</td><td>40</td><td></td><td></td></tr>
<tr><td>Jan</td><td>89</td><td>30</td><td>40</td><td></td><td></td></tr>
<tr><td>Feb</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>Mar</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>Apr</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>May</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
<tr><td>Jun</td><td>89</td><td>178</td><td>40</td><td></td><td></td></tr>
</table></td><td></td><td></td></tr>
<tr><td>Dairy Cross Beef</td><td></td><td>Dairy Cross stock were reared and grazed on farm as a trading line<table>
<tr><th></th><th>Dairy Cross steer calves</th><th>Dairy Cross heifer calves</th></tr>
<tr><td>Jul</td><td></td><td></td></tr>
<tr><td>Aug</td><td>30</td><td>15</td></tr>
<tr><td>Sep</td><td>30</td><td>15</td></tr>
<tr><td>Oct</td><td>30</td><td>15</td></tr>
<tr><td>Nov</td><td>30</td><td>15</td></tr>
<tr><td>Dec</td><td>130</td><td>30</td></tr>
<tr><td>Jan</td><td>130</td><td>30</td></tr>
<tr><td>Feb</td><td>130</td><td>30</td></tr>
<tr><td>Mar</td><td>130</td><td>30</td></tr>
<tr><td>Apr</td><td>130</td><td>30</td></tr>
<tr><td>May</td><td>130</td><td>30</td></tr>
<tr><td>Jun</td><td>130</td><td>30</td></tr>
</table></td><td></td><td></td></tr>
</table>

<table>
<tr><th>Description</th><th>Fawna Farms
YE2020
Dairy Farm</th><th>IFS Growth
YE2020
Mixed Enterprise</th><th>Fawna Farms
Proposed
Dairy Farm</th><th>IFS Growth
Proposed
Forestry</th></tr>
<tr><td>Sheep</td><td>None</td><td>In the Year Ending 2020, sheep were sold with the intention of increasing the beef trading occurring on farm.

Breed: Texel
Birth Rate: 140%
<table>
<tr><th></th><th>MA Ewes</th><th>Hoggets</th><th>Lambs (1050 weaned)</th></tr>
<tr><td>Jul</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Aug</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Sep</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Oct</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Nov</td><td>750</td><td>250</td><td></td></tr>
<tr><td>Dec</td><td>750</td><td>250</td><td>710</td></tr>
<tr><td>Jan</td><td>750</td><td>250</td><td>370</td></tr>
<tr><td>Feb</td><td>750</td><td>250</td><td>40</td></tr>
<tr><td>Mar</td><td>35</td><td>250</td><td>40</td></tr>
<tr><td>Apr</td><td>35</td><td>250</td><td>40</td></tr>
<tr><td>May</td><td>35</td><td>250</td><td>40</td></tr>
<tr><td>Jun</td><td>35</td><td>250</td><td>40</td></tr>
</table>
Greasy wool weight 2625kg

Note: lamb weaning weight and detailed sale records were not available. Industry standard weaning weight has been assumed with lambs leaving the property over Dec, Jan and Feb as described by the farmer.</td><td>None</td><td>NA</td></tr>
</table>

Effluent And Structure

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
In shed feeding	Yes	NA	Yes	NA
Structures	None	NA	None	NA
Farm dairy effluent	Applied to Effluent area (67.1ha) 12-24mm, travelling irrigator Holding pond Solids separated	NA	Applied to Effluent area (176.2ha) 12-24mm, travelling irrigator Holding pond Solids separated	NA
Solid Effluent applications	Applied to pastoral area in December	NA	Applied to pastoral area in December	NA

Supplements

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
Supplements imported	264.8t DDG fed in shed 258.2t PKE fed in shed 132TDM Baleage fed to dairy	None	150TDM DDG fed in shed 150TDM PKE fed in shed	NA
Supplements harvested	144TDM Baleage harvested across entire farm – Fed to Dairy	288TDM baleage harvested on Flat and Rolling Blocks – Fed to dairy grazing and beef	450TDM baleage harvested across entire farm – fed to dairy	NA

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
	80TDM silage harvested across entire farm – Fed to dairy			

Fertiliser

Description	**Fawna Farms** **YE2020** Dairy Farm	**IFS Growth** **YE2020** Mixed Enterprise	**Fawna Farms** **Proposed** Dairy Farm	**IFS Growth** **Proposed** Forestry
Soil tests	As per 2019 test results Olsen P 33	As per 2018 test results (most recent) Olsen P 32	Olsen P of 32	NA
Maintenance Fert	Fertiliser purchase records have been used to enter actual fertiliser use into Overseer Fertiliser applied was above maintenance requirements.	Fertiliser purchase records have been used to enter actual fertiliser use into Overseer Fertiliser applied was below the maintenance requirements	Maintenance fertiliser applied as per Overseer recommendations	NA
Nitrogen	219kgN/ha on pastoral area applied in split applications from August to April	17kgN/ha on the flat and rolling pastoral blocks 6kg/ha on the easy hill pastoral block	189kg/ha N on pastoral area applied in split applications from August to April	NA

Appendix 3: OverseerFM Data Outputs

Fawna Farms YE2020 (Dairy Farm)

Farm nutrient budget

	Total loss (kg/yr)		Loss per ha (kg/yr)				
Nitrogen	17,607		47				
Phosphorus	401		1.1				
Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	208	46	52	60	98	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	40	10	20	5	12	6	5
Rain/clover fixation	80	0	2	5	3	6	28
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	47	1.1	19	90	91	5	15
As product	82	14	19	5	19	2	5
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	93	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	118	11	3	-21	1	1	0
Standing plant material	-16	-2	-13	-3	-10	-2	-2
Inorganic mineral	0	3	-15	0	-2	-3	-4
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	4	29	61	0	13	10	17
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	1	0	0	0	0	0	0

Nitrogen summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Effluent flat (67.1ha)	2647	39.8	11	314	274	219	0	95	18	15
Non effluent flat (71.9ha)	3238	45.2	11	226	225	219	0	7	20	18
Non effluent flat (89.5ha)	2431	34.4	9	226	214	219	0	7	20	14
Non effluent rolling (19.6ha)	432	34.2	10	226	213	219	0	7	3	2
Non effluent rolling (57.9ha)	3136	54.4	13	226	232	219	0	7	16	18
West of road flat (59.3ha)	1950	39.3	11	226	214	219	0	7	14	11
Swedes ('19 and '20) west of road	1003	143.4	30	85	2	85	0	0	2	6
Swedes ('19) non effluent flat	628	105.1	26	175	34	175	0	0	2	4
Swedes ('19) non effluent rolling	718	102.6	25	175	33	175	0	0	2	4
Swedes ('20) non effluent flat	591	49.5	12	138	130	138	0	0	3	3
Swedes ('20) west of road	136	56.5	14	138	130	138	0	0	1	1

Phosphorus summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Effluent flat (67.1ha)	16	0.2	46	0	5
Non effluent flat (71.9ha)	39	0.5	46	0	4
Non effluent flat (89.5ha)	18	0.2	46	0	4
Non effluent rolling (19.6ha)	7	0.5	46	0	4
Non effluent rolling (57.9ha)	120	2	46	0	4
West of road flat (59.3ha)	17	0.3	46	0	4
Swedes ('19 and '20) west of road	4	0.5	44	0	0
Swedes ('19) non effluent flat	1	0.2	70	0	0
Swedes ('19) non effluent rolling	1	0.2	70	0	0
Swedes ('20) non effluent flat	3	0.2	44	0	0
Swedes ('20) west of road	1	0.3	44	0	0

IFS Growth YE2020 (Mixed Enterprise)

Farm Nutrient Budget

	Total loss (kg/yr)	Loss per ha (kg/yr)
Nitrogen	14,099	31
Phosphorus	668	1.5

Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	20	16	3	16	17	0	3
Irrigation	0	0	0	0	0	0	0
Supplements	0	0	0	0	0	0	0
Rain/clover fixation	59	0	2	5	3	6	28
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	31	1.5	22	45	85	5	23
As product	4	1	0	1	2	0	0
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	33	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	17	9	2	-22	0	0	0
Standing plant material	-7	-1	-10	-2	-7	-1	-5
Inorganic mineral	0	1	-17	0	-2	-3	-3
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	3	5	8	0	-59	5	16
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	-2	0	0	0	0	0	0

Fawna Farms

Nitrogen summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Fawna farms - flat (114.9ha)	1673	18.7	4	17	87	17	0	0	20	12
Fawna farms - rolling (26ha)	492	19	4	17	89	17	0	0	6	3
Ifs growth - easy hill (75.9ha)	994	13	-	6	59	6	0	0	17	7
Ifs growth - flat pasture (39.1ha)	379	19	4	17	88	17	0	0	5	3
Ifs growth - rolling pasture (135.7ha)	2431	18.7	4	17	88	17	0	0	29	17
Fb ' 20 (fawna flat)	374	90.9	19	117	159	117	0	0	1	3
Fb '19 (fawna flat)	1672	179.2	33	47	37	47	0	0	2	12
Fb '19 (ifs rolling)	1109	158.5	28	47	43	47	0	0	2	8
Fb '19 - fb '20 (fawna flats)	1120	197.4	36	117	111	117	0	0	1	8
Fb '19 - swede '20 (fawna flat)	91	214.9	38	105	102	105.3	0	0	0	1
Fb '19 - swede '20 (ifs flat)	1725	254	44	117	108	117	0	0	2	12
Fb '20 (ifs flat)	1189	97	20	117	157	117	0	0	3	8
Swedes '19 (fawna flat)	611	135.2	25	47	44	47	0	0	1	4
Fawna - qe2 block	72	3	-	0	0	0	0	0	5	1
Ifs growth - native bush	67	3	-	0	0	0	0	0	5	0
Ifs growth - qe2	22	3	-	0	0	0	0	0	2	0

Phosphorus summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Fawna farms - flat (114.9ha)	67	0.8	15	0	0
Fawna farms - rolling (26ha)	60	2.3	15	0	0
Ifs growth - easy hill (75.9ha)	126	1.7	15	0	0
Ifs growth - flat pasture (39.1ha)	16	0.8	15	0	0
Ifs growth - rolling pasture (135.7ha)	271	2.1	15	0	0
Fb ' 20 (fawna flat)	4	1.2	32	0	0
Fb '19 (fawna flat)	11	1.2	50	0	0
Fb '19 (ifs rolling)	8	1.2	50	0	0
Fb '19 - fb '20 (fawna flats)	8	1.4	32	0	0
Fb '19 - swede '20 (fawna flat)	0	1.4	28.8	0	0
Fb '19 - swede '20 (ifs flat)	11	1.6	32	0	0
Fb '20 (ifs flat)	16	1.3	32	0	0
Swedes '19 (fawna flat)	5	1.2	50	0	0
Fawna - qe2 block	2	0.1	0	0	0
Ifs growth - native bush	2	0.1	0	0	0
Ifs growth - qe2	1	0.1	0	0	0

Fawna Farms Proposed (Dairy Farm)

Farm nutrient budget

	Total loss (kg/yr)			Loss per ha (kg/yr)			
Nitrogen	28,835			54			
Phosphorus	613			1.1			
Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	168	28	20	19	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	16	4	6	2	4	2	2
Rain/clover fixation	93	0	2	5	3	6	28
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	54	1.1	16	41	94	5	17
As product	64	11	15	4	15	1	4
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	89	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	64	12	3	-19	1	0	0
Standing plant material	-16	-2	-15	-1	-2	-1	-1
Inorganic mineral	0	2	-23	0	-2	-3	-4
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	16	7	33	0	-99	6	13
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	7	1	0	1	0	0	0

Nitrogen summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Effluent flat (67.1ha)	1918	31.8	9	244	227	189	0	56	13	7
Effluent flat (89.5ha)	2600	32.4	9	244	227	189	0	56	17	9
Effluent rolling (19.6ha)	592	34.1	9	244	227	189	0	56	4	2
Fawna farms (flats)	5188	50.6	12	195	213	189	0	6	22	18
Fawna farms - rolling	1229	53	12	195	216	189	0	6	5	4
Non effluent flat (71.9ha)	2512	39.3	10	195	203	189	0	6	14	9
Non effluent rolling (57.9ha)	2422	46.8	11	195	210	189	0	6	11	8
West of road flat (59.3ha)	1819	34.3	9	195	193	189	0	6	11	6
Swedes (53.7ha)	9602	179	39	90	33	90	0	0	-	33
Qe2 block	72	3	-	0	0	0	0	0	5	0

Phosphorus summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Effluent flat (67.1ha)	14	0.2	26	0	4
Effluent flat (89.5ha)	19	0.2	26	0	4
Effluent rolling (19.6ha)	8	0.5	28	0	4
Fawna farms (flats)	80	0.8	27	0	4
Fawna farms - rolling	58	2.5	30	0	4
Non effluent flat (71.9ha)	32	0.5	26	0	4
Non effluent rolling (57.9ha)	98	1.9	30	0	4
West of road flat (59.3ha)	16	0.3	27	0	4
Swedes (53.7ha)	69	1.3	50	0	0
Qe2 block	2	0.1	0	0	0

IFS Growth Proposed (Forestry)

Farm Nutrient Budget

	Total loss (kg/yr)			Loss per ha (kg/yr)			
Nitrogen	730			3			
Phosphorus	35			0.1			
Nutrients added (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	0	0	0	0	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	0	0	0	0	0	0	0
Rain/clover fixation	3	0	3	5	3	8	37
Nutrients removed (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Leaching, runoff and direct losses	3	0.1	3	5	3	8	37
As product	0	0	0	0	0	0	0
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	0	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0
Change in pools (kg/ha/yr)	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**
Organic pool	0	0	0	0	0	0	0
Standing plant material	0	0	0	0	0	0	0
Inorganic mineral	0	0	0	0	0	0	0
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	0	0	0	0	0	0	0
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	0	0	0	0	0	0	0

Nitrogen Summary

	Total loss (kg)	Loss per ha (kg/ha)	N in drainage (ppm)	Added (kg/ha)	Surplus (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)	Blocked area %	Farm loss %
Ifs growth - easy hill (75.9ha)	190	2	-	0	0	0	0	0	28	26
Ifs growth - flat (39.1ha - 5.2ha setbacks)	85	2	-	0	0	0	0	0	12	12
Ifs growth - native bush	67	3	-	0	0	0	0	0	8	9
Ifs growth - qe2	22	3	-	0	0	0	0	0	3	3
Ifs growth - rolling pasture (135.7ha)	339	2	-	0	0	0	0	0	49	46

Phosphorus Summary

	Total loss (kg)	Loss per ha (kg/ha)	Fertiliser (kg/ha)	Irrigation (kg/ha)	Effluent (kg/ha)
Ifs growth - easy hill (75.9ha)	9	0.1	0	0	0
Ifs growth - flat (39.1ha - 5.2ha setbacks)	4	0.1	0	0	0
Ifs growth - native bush	2	0.1	0	0	0
Ifs growth - qe2	1	0.1	0	0	0
Ifs growth - rolling pasture (135.7ha)	16	0.1	0	0	0

APPENDIX C - CURRENT RESOURCE CONSENTS

Cnr North Road and Price Street
(Private Bag 90116)
Invercargill

Telephone (03) 211 5115
Fax No. (03) 211 5252
Southland Freephone No. 0800 76 88 45

Discharge Permit

Pursuant to Section 104B of the Resource Management Act 1991, a resource consent is hereby granted by the Southland Regional Council (the "Council") to **Feldwick Lindsay Farms Ltd** (the "consent holder") of **385 Feldwick, RD 2, Otautau 9682** from 23 May 2014.

Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.

Details of Permit

Purpose for which permit is granted:		To discharge dairy shed effluent to land
Location	- site locality	39 Lindsay Road, Feldwick
	- map reference	NZTM 1201548 4890938
	- receiving environment	Land
	- catchment	Orauea Stream
Legal description of land at the site:		Part Section 94 Waiau Survey District, Part Section 29 Block IX Waiau Survey District, Lot 3 DP 340527, Section 18 Merrivale Settlement No 2
Expiry date:		23 May 2024

Consent Amended

Conditions amended on 7 August 2014, as follows:

Schedule of Conditions

These conditions should be read in conjunction with the best practice recommendations that are appended. These will reduce the risk of non-compliance with the consent conditions.

1. This consent is granted for a period of 10 years.

(Note: Pursuant to Sections 123 and 124 of the Resource Management Act 1991, a new consent will be required at the expiration of this consent. The application will be considered in accordance with the plans in effect at that time, and the adverse effects of the proposed activity.)

2. (a) This consent authorises the discharge of dairy shed effluent onto land, via a land disposal system, as described in the application, on land known as Part Section 94 Waiau Survey District, Part Section 29 Block IX Waiau Survey District, Lot 3 DP 340527, Section 18 Merrivale Settlement No 2.

   (Note: The effluent disposal area shown in Appendix 1 can be altered and/or extended, subject to the approval of the Director of Policy, Planning & Regulatory Services, if the consent holder submits a new plan showing the new effluent disposal area, and providing the written approval(s) of any person whose property boundary will be closer to that area. In the event that written approval cannot be obtained, the effluent disposal area can only be amended by way of limited notification.)

   (b) This consent excludes effluent from winter milking, or any feedlot or wintering pad.

3. (a) No dairy shed effluent shall be discharged to any surface watercourse by overland flow, run-off, or via a pipe, nor shall there be any surface run-off/overland flow, ponding or contamination of water resulting from the exercise of this consent. ***See Best Practice Notes 1, 2 & 3.***

   (b) The land disposal system shall be operated and maintained to ensure that there is no offensive or objectionable odour beyond the property boundary, or any spray drift into or beyond the buffer zones specified in condition 5.

   (c) The consent holder shall install and maintain an alarm and automatic switch-off system as a contingency measure in the event of an effluent system failure such as a sudden pressure drop, irrigator stoppage or breakdown. ***See Best Practice Note 4***

4. Subject to condition 3(a), the land disposal system is limited to the following:

   (i) a maximum depth of application of 10 mm for each individual application, at an instantaneous rate not exceeding 10 mm/hour;

   (ii) the maximum loading rate of nitrogen onto any land area shall not exceed 150 kg of nitrogen per hectare per year from dairy shed effluent. ***See Best Practice Note 5***

5. Effluent may be applied to the land as described in the application and generally as shown in Appendix 1, but the following specific buffers shall be observed:

   (a) 20 metres of any surface watercourse;
   (b) 100 metres of any potable water abstraction point;
   (c) 20 metres of any property boundary (unless the adjoining landowner's consent is obtained to do otherwise); and
   (d) 200 metres of any residential dwelling other than residential dwellings on the property.

   Where there is conflict between Appendix 1 and these specified buffers, the latter shall apply.

6. The amount of dairy shed effluent disposed of onto land shall not exceed that from 900 cows.

7. By 24 December 2014 the consent holder shall provide at least 4,880 m^3 of effluent storage for the purpose of:

   (a) avoiding irrigation of effluent when soils are at or above field capacity – ***see Best Practice Note 8;***
   (b) providing a contingency measure when the irrigation system is inoperative; and/or
   (c) for primary treatment when it is necessary for the proper operation of the effluent disposal system.

8. The consent holder shall notify the Council, by 1 December 2014, of the person who is in charge of the operation of the effluent disposal system. If the person in charge of the effluent system changes during the term of this consent, the consent holder shall notify the Council of the new operator no later than five working days after that person takes responsibility. ***See Best Practice Notes 6 & 7.***

   (Note: The person identified by condition 8 will be the primary contact for Council staff for monitoring purposes and/or in the event of an incident. Nothing in this condition removes or limits the consent holder's liability to ensure compliance with the consent and its conditions.)

9. The Southland Regional Council may serve notice of its intention to review the conditions of this consent, in accordance with the conditions of this resource consent and Sections 128 and 129 of the Resource Management Act 1991, during the period 1 February to 30 September each year, or within two calendar months of the completion of any enforcement action (prosecution or infringement notice), for the purposes of:

   (a) dealing with any adverse or cumulative effects, including the adverse effects of high stocking rates, on the environment which may arise from the exercise of this consent;
   (b) considering any changes to information on the effects of land disposal of dairy shed effluent;
   (c) complying with the requirements of a regional plan;
   (d) amending monitoring requirements; or
   (e) imposing a notification requirement for potential effects on registered drinking water supplies.

10. The consent holder shall pay an annual administration and monitoring charge to the Southland Regional Council, collected in accordance with Section 36 of the Resource Management Act. This charge may include the costs of inspecting the site up to twice each year (or otherwise as set by the Council's Annual Plan), and of monitoring the effects of the discharge on surface water, as follows:

   (a) monitoring of watercourses may be undertaken up to two times each year;

   (b) representative samples will be taken from the watercourse near the effluent disposal field, upstream and downstream of the discharge area, at points approved by the Council's Compliance Manager.

   (c) the samples will be analysed for:

      - pH
      - electrical conductivity
      - ammoniacal nitrogen concentration
      - nitrate nitrogen concentration

- dissolved reactive phosphorous concentration
- *E. coli* concentration

(Note: This monitoring can be undertaken to also meet the requirements of Condition 8 of the Land Use Consent for the Conversion AUTH-20146434-04.)

11. If an event (such as effluent overflow to water, significant over-application on a free-draining area or pond collapse) occurs that may have significant adverse effect on water quality, particularly at the abstraction point of a registered drinking-water supply, the consent holder shall notify, as soon as reasonably practicable, the following:

    - Environment Southland's Compliance Manager (ph 03 211 5115 or 03 211 5225 after hours)
    - Southland District Council (ph 0800 732 732)

    (Note: The consent holder is advised to contact Environment Southland's Compliance Manager in the event of any unexpected event that may result in non-compliance with the conditions of this resource consent or the rules of a regional plan.)

for the **Southland Regional Council**

Vin Smith
Director of Policy, Planning and Regulatory Services

Best Practice and Explanatory Notes

1. Dairy shed effluent should not be discharged onto any land area that has been grazed within the previous 5-10 days. Where there has been significant damage to soil during grazing, it is recommended that effluent not be applied until that damage has been repaired.

2. To avoid contaminating water directly or indirectly, the consent holder should not apply effluent to land when the soils are at or above field capacity. Moisture content is to be determined by either actual monitoring on site or by reference to the appropriate Council monitoring site. The Council's soil moisture monitoring sites can be viewed at *http://www.es.govt.nz* and following the "Farming", "Dairy Advisor" and "Soil Moisture Map" links.

3. For the purposes of this condition, ponding is the accumulation of effluent on the soil surface resulting from the application of effluent to saturated soils, or the application of effluent inducing saturated soil conditions. It does not refer to the temporary accumulation of effluent on the soil surface resulting from the application of effluent at a rate that exceeds the soil infiltration rate.

4. Where the effluent reticulation system is installed in such a way that effluent can be siphoned when pumping ceases, the consent holder should install and maintain an anti-siphon device in the effluent pipe line.

5. A loading of 150 kg N/ha/year is approximately equivalent to a loading of dairy shed effluent to land of 4 ha/100 cows. However, there are significant benefits to having a larger effluent disposal area in terms of managing potassium. Further, scientific research has highlighted decreased nitrogen use efficiency and increased nitrogen leaching losses at annual nitrogen loading rates (from combined fertiliser and effluent N) greater than 150 kg/N/ha/yr. Extreme caution should therefore be taken when applying nitrogen fertiliser to the effluent disposal area. It is recommended that a nutrient budget is used to check that nitrogen and potassium application rates to the effluent disposal area are not excessive.

6. The consent holder should prepare and comply with a Farm Environmental Management Plan. The plan should:

   - specify and implement a nutrient budgeting system for the property;
   - provide for the management of effluent disposal to avoid applications when soils are at or above field capacity;
   - identify, as far as is practicable, the drains in the effluent disposal area, so that appropriate management procedures can be taken to avoid contamination of the drains by effluent;
   - if relevant, provide for the operation and management of any feedlot and/or wintering pad;
   - include the provision for monitoring application rates to ensure the consent requirements are being met;
   - include the monitoring requirements specified in this consent; and
   - address ancillary matters such as protecting well-head(s) from contamination; preventing leachate from any silage pits entering water, including groundwater; preventing soil damage; controlling runoff from lanes; and preventing stock access to and maintaining the riparian margins of any watercourses on the property.

A template may be viewed at:
http://www.es.govt.nz/media/4831/dairy-farm-plan-consent-template.pdf

7. The consent holder should display, in a prominent place in the dairy shed, a copy of the resource consent and relevant limits about the operation of the effluent disposal system that must be complied with. The material to be displayed will be provided by the Council on laminated sheets suitable for display purposes.

8. Storage ponds should be operated at low levels when conditions for effluent disposal are suitable in order to maintain storage for wet weather periods. In particular, storage ponds should be emptied in late summer/early autumn to ensure sufficient storage capacity for the following late winter/early spring period.

9. Storage ponds should not, for practical purposes, leak. This resource consent does not authorise the discharge of contaminants due to leaks or failure of the storage ponds. If an existing storage pond is modified (such as by increasing the embankment height to increase storage), the modification will require resource consent.

Environment Southland*

(03) 211 5115

Toll Free 0800 76 88 45 (Southland only)

or

Emergency After Hours (03) 211 5225

if you have an effluent or pollution problem, call us

environment SOUTHLAND

Held by: Feldwick Lindsay Farms Ltd

- the total milking herd cannot exceed 900 cows.
- effluent may only be applied within the area shown on the attached map, as detailed in the application for the Consent.
- effluent cannot be applied within 20 metres of the property boundary.
- if there are waterways within the approved area, effluent cannot be applied within 20 metres of the waterways and ditches.
- a maximum depth of application of 10 mm for each individual application, at an instantaneous rate not exceeding 10 mm/hour
- the contingency plan consists of:
  - Ability to defer the effluent discharge by storing effluent in a 4,880 m^3 storage pond during adverse conditions.

(the above is a synopsis. You should ensure you understand the full consent. If you do not have a copy, contact Environment Southland*)

Problem Solving

• the number of cows intended to be milked exceeds the consent limit	**Contact Environment Southland for a Variation to the Consent**

If you have any effluent or pollution problems, please contact Environment Southland at the following numbers: Environment Southland: (03) 211 5115 or 0800 76 88 45 during office hours or 03 211 5225 (emergency response) after hours.

environment SOUTHLAND

Appendix 1
Feldwick Lindsay Farms Ltd

Date: 28/8/2014

N

1:16,475

Cnr North Road and Price Street
(Private Bag 90116
DX YX20175)
Invercargill

Telephone (03) 211 5115
Fax No. (03) 211 5252
Southland Freephone No. 0800 76 88 45

Water Permit

Pursuant to Section 104B of the Resource Management Act 1991, a resource consent is hereby granted by the Southland Regional Council to **Feldwick Lindsay Farms Limited** of **385 Feldwick, RD2 Otautau** from **20 April 2020**

Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.

Details of Permit

Purpose for which permit is granted:		To take and use groundwater for the purpose of stockwater and dairy shed use
Location	- site locality	39 Lindsay Road, Feldwick
	- map reference	D45/0316 1201548E 4890938N D45/0355 1200616E 4891852N D45/0349 1200769E 4891929N D45/0351 1200311E 4891492N D45/0348 1199641E 4891507N
	- groundwater zone	Unclassified
	- catchment	Orauea Stream
Legal description of land at the site:		Part Section 94 Waiau Survey District, Part Section 29 Block IX Waiau Survey District, Lot 3 DP 340527, Section 18 Merrivale Settlement No 2.
Expiry date:		**20 April 2030**

History of Changes and Transfers

- **Consent corrected 7 May 2020**

Schedule of Conditions

1. This consent shall not be exercised until Water Permit AUTH-20146434-02 is surrendered or has expired.

2. The consent authorises the abstraction of groundwater at the location specified above. The rate of abstraction shall not exceed:
   (a) 2 litres per second;
   (b) 140 cubic metres per day; and
   (c) 51,100 cubic metres per year.

Advice Note

The Consent Holder must ensure that the bore that water abstraction occurs from can meet the following conditions:

The bore or well design and headwork's prevent:
- *i. the infiltration of contaminants; and*
- *ii. the uncontrolled discharge or leakage of water to the ground surface or between aquifers.*

Should the bore not meet the above conditions, the Consent Holder shall apply to the Consent Authority for a Resource Consent for the use and maintenance of the bore.

3. 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.

4.
   (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. There shall be a straight length of pipe on either side of the water meter, on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of 5 times the diameter of the pipe.
   (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 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.

5. 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.

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 2, should monitoring under Condition 4 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.

Reissued 7 May 2020 following Section 133A correction to bore name location 1200769E 4891929N

for the **Southland Regional Council**

Lacey Bragg
Team Leader Consents

Notes:

1. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent shall lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*
2. *Section 126 of the Resource Management Act provides for this resource consent to be cancelled if the consent has been exercised in the past but has not been exercised during the preceding five years.*
3. *If you require a replacement permit upon the expiry date of this permit, any new application should be lodged at least six months prior to the expiry date of this permit. Applying at least six months before the expiry date may enable you to continue to exercise this permit until a decision is made, and any appeals are resolved, on the replacement application.*
4. *The Consent Holder shall pay an administration and monitoring charge to the Consent Authority collected in accordance with Section 36 of the Resource Management Act, payable in advance on 1 July each year.*

APPENDIX D – EFFLUENT CHECK SHEET

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FAWNA FARMS LTD: Effluent Systems Monthly Check Sheet

On a monthly basis, the following checks and measures must be undertaken. The details of the monthly check shall be recorded on this sheet, and at the completion of the inspection the sheet shall be filed for future reference. If there are any matters requiring follow up work i.e. you note that an effluent nozzle needs replacing, please make a note of these, and ensure that the actions are followed up immediately.

Date:…………………………………………………………………………. Employee:…………………………………………………………………..

- ☐ Record volume of water abstraction ………………………………………………………………………………………………………
- ☐ Clean stone trap.

  Any further actions required? Y/N

  Explanation………
- ☐ Check sump.

  Any further actions required? Y/N

  Explanation………
- ☐ Check sludge bed levels and if it needs clearing, shift solids to drying area.

  Any further actions required? Y/N

  Explanation………
- ☐ Check all inlet and outlet pipes to storage pond to ensure they are free of debris to prevent blockages.

  Any further actions required? Y/N

  Explanation……
- ☐ Check effluent nozzles are clear and in good working order.

  Any further actions required? Y/N

  Explanation………
- ☐ Check effluent irrigator pipe is in good working order and does not have any leaks.

  Any further actions required? Y/N

  Explanation………
- ☐ Check well-head(s) remain capped.

  Any further actions required? Y/N

Explanation………

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APPENDIX E – EFFLUENT MOVEMENT RECORDS

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EFFLUENT MOVEMENT SHEET

Date	Paddocks	Hydrant Time	Rest Time	Run Time	Comments	Sign

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APPENDIX F – STAFF TRAINING GUIDE

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Effluent Orientation and Training Record

Season ___/___

Effluent Competencies	Employee name	Employee name	Employee name
General			
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			
At the Dairy			
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)			
In the Paddock			
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 checks			
Measuring the depth of effluent application			
Irrigator, pump maintenance/cleaning			
Greasing and general maintenance requirements (how and when)			
How to check and replace rubber nozzles and seals (same time as dairy rubber ware)			
Tyre pressure and condition			
Pipe-work, hose and hydrant condition			
Wire-rope, cam and ratchet condition			
Other			

Trainer signature			
Employee signature			
Date			

Date when staff become competent in each skill. If all training provided in one day, tick and date at the bottom.

DairyNZ

Attachment 2

Irricon Resource Solutions OVERSEER Nutrient Budget Review Report on behalf of Council under S92(2) of the RMA

Irricon resource solutions

OVERSEER Nutrient Budget Review

For: Environment Southland – Fawna Farms Ltd

Prepared by: Nicky Watt, CNMA

Date: 25th October 2022

www.irricon.co.nz

Introduction

1. Regarding the consent application for Fawna Farms Ltd, I have reviewed the following OVERSEER ® Nutrient Budget (OVERSEER) files:
   a) A Fawna Farms YE20 (v1)
   b) B IFS Growth YE20 (v1)
   c) C Fawna Farms Proposed (v1)
   d) D IFS Growth Proposed (v1)

2. Along with the files I have reviewed the following accompany report: "OverseerFM farm system modelling to support a consent for expanded dairy" prepared by Mo Topham , AgriAce Consulting Ltd and reviewed by Miranda Hunter, Roslin Consultancy Ltd. I have completed a robustness check on the file for sensibility based on data available and checked to ensure the modelling aligns with the OVERSEER Best Practice Data Input Standards for v6.4.3.

3. It must be assumed that the information provided in the OVERSEER files that the current farming system as modelled is a viable farming system, using actual stock and fertiliser inputs. Therefore, the actual and proposed scenario is also assumed to be appropriate for the location and climate.

4. A 'sensibility test' has been undertaken on the Fawna Farms Ltd nutrient budgets with the following five output screens from OVERSEER forming the basis of the determination of the robustness of the nutrient budget:

   a) Is the nutrient loss consistent with what you would expect for an operation of this type and soils in this location?

   b) Does the summary of inputs and outputs make sense? Especially clover fixation and change in block pools?

   c) Check the 'Other values' block reports for rainfall, drainage, and PAW.

   d) Select the Scenario reports other values and check the production and stocking rate.

   e) Select the pasture production in the scenario report and check pasture growth.

5. Answers to each of these five points will be provided further in this report and then a final determination of the robustness of the nutrient loss to water will be provided at the end of this report.

OVERSEER AUDIT

Appropriateness of the Overseer inputs

1. The Overseer FM files submitted and stated in paragraph 1 of this report have been reviewed for consistency between the files and appropriateness of the inputs regarding the farming systems and the Overseer Best Practice Data Input Standard (BPDIS).

2. I concur that there are no deviations from the BPDIS.

3. The combination of the YE20 models for Fawna and IFS had a total of 825.5 ha and an effective area of 810.6 ha. The combined Proposed models for Fawna and IFS had a total area of 825.5 ha and an effective area of 530.3 ha. The combination of the YE20 models for Fawna and IFS had a revised stocking rate of 27.6 RSU/ha for dairy cows on the effective dairy grazed pasture area. The combined Proposed models for Fawna and IFS had a revised stocking rate of 26.8 RSU/ha for the

effective dairy grazed pasture area or a 2.9 % decrease in RSU/ha for effective dairy grazed pasture area. The combination of the YE20 models for Fawna and IFS had a total revised stocking rate of 16.3 RSU/ha for all animals on the effective area. The combined Proposed models for Fawna and IFS had a total revised stocking rate of 22.5 RSU/ha for the effective area or a 27.6% increase in RSU/ha for effective area (see Table 1a below).

4. Reviewing the NZ Dairy statistics for the 2019/2020 season, shows the average milk solids production on this property for the Fawna YE20 model at 465.3 kgMS/cow and 1266 kgMS/ha is respectively higher than the Southland Regional average of 414 kg MS/cow and higher than the Southland Regional average of 1,133 kgMS/ha. The Fawna Prop model at 387.1 kgMS/cow and 948 kgMS/ha are respectively lower than the Southland Regional average of 414 kg MS/cow and lower than the Southland Regional average of 1,133kgMS/ha.

5. The dairy cow stocking rate for Fawna YE20 and Fawna Prop models at 2.7 cows/ha and 2.5 cows/ha are both respectively lower than the Southland average for the 2019/2020 season of 2.71 cows/ha (Southland).

6. It is noted that the Dairy cows have been modelled as lactating cows and since there is a drying-off date in May the cows are pregnant but no longer lactating from this date through June and July until they have calved. As there is a mean calving date for August the model then assumes there is an average number of lactating cows (cows calved and now in milk) for August onwards.

Table 1: Summary of Production and stocking rate

	Fawna YE20[1]	IFS YE20[2]	Fawna Prop[3]	IFS Prop[4]
Total Ha	370.9	454.6	536.8	288.7
Effective Area (ha)	365.3	391.6	530.3	-
Effective Pasture Area (ha)	330.9	362.4	452.5	-
KgMS	418777	-	480000	-
MS kg/ha grazed	1266	-	948	-
MS kg MS/cow	465.3	-	387.1	-
Dairy RSU	9126	-	12131	-
Dairy RSU/ha (pasture area)	27.6	-	26.8	-
Total RSU	9872	2483	12598	-
Total RSU/ha	27.0	6.3	23.8	-
Lactation Length	266	-	266	-
Cows/ha (per ha grazed)	2.7	-	2.5	-
Cows October	870	-	1200	-
Cows June	50	-	955	-
Cows July	320	-	1240	-
Replacements June	220	740	-	-
Replacements July	0	695	-	-
Replacement RSU	621	1447	416	-
Beef RSU	125	-	51	-
Sheep RSU	-	1036	-	-
N lost kg/ha/yr	47	31	54	3

A Fawna Farms YE20 (v1)- Fawna YE20[1]
B IFS Growth YE20 (v1) – IFS YE20[2]
C Fawna Farms Proposed - Fawna Prop[3]
D IFS Growth Proposed – IFS Prop[4]

Table 1a: Summary of combined production and stocking rate

	YE20	Proposed
Total Ha	825.5	825.5
Effective Area (ha)	756.9	530.3
Effective Pasture Area (ha)	706.3	452.5
KgMS	418777	480000

MS kg/ha grazed	1266	948
MS kg MS/cow	465.3	387.1
Dairy RSU	9126	12131
Dairy RSU/ha (pasture area)	26.5	27.8
Total RSU	12355	12598
Total RSU/ha	16.3	22.5
Lactation Length	266	266
Cows/ha (per ha grazed)	2.7	2.5
Cows October	870	1200
Cows June	50	955
Cows July	320	1240
Replacements June	960	-
Replacements July	695	-
Replacement RSU	2068	416
Beef RSU	125	51
Sheep RSU	1036	-
Total N Lost (kg/yr)	31706	29565
N lost (kg/ha/yr)	38.4	35.8

7. The combination of the YE20 models for Fawna and IFS showed an area of 28.6 ha of swedes grazed in the winter 2020 by dairy cows, beef, and replacements and 22 ha of fodder beet grazed in the winter by beef and replacements. This is a total of 50.6 ha of winter feed grown and grazed by dairy cows, beef, and replacements. The combined Proposed models for Fawna and IFS had 53.7 ha of swede grazed in the winter by dairy cows and replacements. This is a total of 53.7 ha of winter crops grazed by dairy cows and replacements. This is a 5.8 % increase in winter crop grown in the Proposed model (see Table 2a below). It was noted in the supplementary report that there was a maximum area of 58.4 ha of winter crop grazed during the Reference Period.

Table 2: Crop Details

	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop
Fodder Beet Crop (ha)	-	22	-	-
Fodder Beet Yield (tDM/ha)	-	20	-	-
When grazed	-	June to Sept	-	-
Grazed By	-	Beef and Dairy Grazing	-	-
Swedes Crop (ha)	21.4	7.2	53.7	-
Swedes Yield (tDM/ha)	12	12	12	-
When grazed	June to Sept	June to Sept	June to Sept	-
Grazed by	Dairy & replacements	Beef & dairy grazing	Dairy and replacements	-

Table 2a: Combined Crop Details

	YE20	Proposed
Fodder Beet Crop (ha)	22	-
Fodder Beet Yield (tDM/ha)	20	-
When grazed	June to Sept	-
Grazed By	Beef and Dairy Grazing	-
Swedes Crop (ha)	28.6	53.7
Swedes Yield (tDM/ha)	12	12
When grazed	June to Sept	June to Sept
Grazed by	Dairy, Beef & replacements	Dairy and replacements

8. The soil areas are with margin of error for all soils (see Table 3 below).

Table 3: Soil Details

	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop

Hedge_4a.1	174.2	-	174.2	-
Auchr_9b.1	73.9	302.4	191.8	184.5
Apar_6a.1	66.6	-	66.6	-
Eure_22a.1	20.1	-	20.1	-
Tuap_6b.2	19.6	-	19.6	-
Ihak_23a.1	10.9	-	10.9	-
Malok_3a.1	-	66.2		66.2
Waiau_3a.1	-	11.6	11.5	--
Makar_3b.1	-	11.4	11.5	-

9. Supplements are imported to meet cow demand (see Table 4 below). Pasture silage has been made where there was a surplus of pasture. The combination of the YE20 models for Fawna and IFS had a pasture growth calculated at 16.1 tDM/ha and the combined Proposed models for Fawna and IFS had a pasture growth of 15.9 tDM/ha for dairy pasture. This is a 1.2% decrease in pasture growth. The N used on all pasture blocks for the combination of the YE20 models for Fawna and IFS was 219 kgN/ha for non-effluent and effluent areas compared to 189 kgN/ha for effluent and non-effluent areas in the combined Proposed models for Fawna and IFS. This is a 13.7 % decrease in N fertiliser used. There is expected to be 35.6% less supplement imported per hectare, and 20% more silage harvested in the combined Proposed models for Fawna and IFS compared to the combination of the YE20 models for Fawna and IFS (see Table 4a below).

Table 4: Supplements imported and Harvested

	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop
Supplements Imported (tDM)	655	-	300	-
Supplements Imported Effective Area (tDM/ha)	1.79	-	0.56	-
Silage Harvested (tDM)	224	288	450	-
Silage Harvested Eff Pasture (tDM/ha)	0.61	0.73	0.85	-
Total Area (ha)	370.9	454.6	536.8	288.7
Effective Area (ha)	365.3	391.6	530.3	-
Effective Pasture Area (ha)	343.9	362.4	452.5	-
Dairy RSU	9126	-	12131	-
Dairy RSU/ha (eff pasture area)	26.5	-	26.8	-
Total RSU	9872	2483	12598	-
Total RSU/ha	27.0	6.3	23.8	-
Cows/ha (per ha grazed)	2.7	-	2.5	-
N Fertiliser applied non -effluent area(kgN/ha)	219*	-	189	-
N Fertiliser applied effluent Area (kgN/ha)	219*	-	189	-
N Fertiliser on support pasture area (kgN/ha)	-	17	-	-
Pasture Growth support area (tDM/ha)	-	10.4	-	-
Pasture Growth dairy area (tDM/ha)	16.1	-	15.9	-

*This exceeds the 190 kgN/ha N cap

Table 4a: Combined Supplements imported and Harvested

	YE20	Proposed
Supplements Imported (tDM)	655	300
Supplements Imported Effective Area (tDM/ha)	0.87	0.56
Silage Harvested (tDM)	512	450
Silage Harvested Eff Pasture (tDM/ha)	0.68	0.85
Total Area (ha)	825.5	825.5
Effective Area (ha)	756.9	530.3
Effective Pasture Area (ha)	706.3	452.5
Dairy RSU	9126	12131
Dairy RSU/ha (eff pasture area)	26.5	27.8
Total RSU	12355	12598
Total RSU/ha	16.3	22.5
Cows/ha (per ha grazed)	2.7	2.5
N Fertiliser applied non -effluent area(kgN/ha)	219	189
N Fertiliser applied effluent Area (kgN/ha)	219	189

N Fertiliser on support pasture area (kgN/ha)	17	-
Pasture Growth support area (tDM/ha)	10.4	-
Pasture Growth dairy area (tDM/ha)	16.1	15.9

Overseer Outputs

10. The N lost to water for the combination of the YE20 models for Fawna and IFS was 38.4 kgN/ha/yr (31706 kgN/annum) compared to 35.8 kgN/ha/yr (29565 kgN/annum) for the combined Proposed models for Fawna and IFS which is an 6.8% reduction in the total N loss. The P lost for the combination of the YE20 models for Fawna and IFS showed was 0.52 kgP/ha/yr (432 kgP/annum) compared to 1.29 kgP/ha/yr (1069 kgP/annum) for the combined Proposed models for Fawna and IFS which is a 39.4% decrease in total P loss (see Table 5a below). It is assumed that the information provided in this farming system is modelled as a viable farming system, using actual stock and fertiliser inputs.

Table 5: OVERSEER outputs

Overseer v6.4.3	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop
N lost to water kg/ha/yr	47	31	54	3
Total N lost kg/farm	17607	14099	28835	730
P lost kg/ha/yr	1.1	1.5	1.1	0.1
Total P lost kg/farm	401	668	613	35
Other sources – N	695	79	882	28
Other sources – P	176	59	217	3

Table 5a: Combined OVERSEER outputs

Overseer v6.4.3	YE20	Proposed
N lost to water kg/ha/yr	38.4	35.8
Total N lost kg/farm	31706	29565
P lost kg/ha/yr	1.29	0.78
Total P lost kg/farm	1069	648
Other sources – N	774	910
Other sources – P	235	220

Change in block pools

11. The organic pool for N indicates the amount of N that is being either immobilized as seen by a ‘positive’ Organic pool N value or being mineralized as seen by a ‘negative’ Organic pool N value. N being immobilized is being used for increased biological activity and temporarily locked up. Once the microorganisms die the organic N in their cells is converted by mineralization and nitrification to plant available nitrate. It appears N is potentially being immobilized in all models (see Table 6 below).

12. The inorganic soil pool for P indicates the amount P that exceeds soil P maintenance as seen by a ‘positive’ inorganic soil P value or is less than the soil P maintenance requirements as seen by a ‘negative’ inorganic soil P value. Above maintenance P was applied to the Fawna YE20 model and slightly above maintenance was applied to the remaining models (see Table 6a below).

Table 6: Change in block pool (N)

	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop
Organic Pool	118	17	64	0
Inorganic Mineral	0	0	0	0
Inorganic Soil Pool	4	3	16	0

Table 6a: Change in block pool (P)

	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop
Organic Pool	11	9	12	0
Inorganic Mineral	3	1	2	0
Inorganic Soil Pool	29	5	7	0

Rain/clover N Fixation

All plants, including forage crops, need relatively large amounts of nitrogen for growth and development. Biological nitrogen fixation is the term used for a process in which nitrogen gas (N2) from the atmosphere is incorporated into the tissue of certain plants. Only a select group of plants can obtain N this way, with the help of soil microorganisms. Among forage plants, the group of plants known as legumes (predominantly Clover in NZ pastures) are well known for being able to obtain N from air N2. The OVERSEER Technical Manual – Characteristics of Pasture, April 2015 indicates that biological N fixation is based on total pasture production and includes the fertiliser induced reduction in N fixation.

13. The Biological fixation for the combination of the YE20 models for Fawna and IFS is 66 kg/ha /year compared to the the combined Proposed models for Fawna and IFS at 60 kg/ha/year. This is a 9.1% decrease (see table 7a below).

14. The N added to pasture for the combination of the YE20 models for Fawna and IFS was 108 kgN/ha compared to 123 kgN/ha for the combined Proposed models for Fawna and IFS (a 12.2 % increase in N used).

15. The decrease in biological fixation in the the combined Proposed models for Fawna and IFS can largely be explained by the 12.2 % increase in N fertiliser applied.

Table 7: Biological fixation

	Fawna YE20	IFS YE20	Fawna Prop	IFS Prop
Total Area (ha)	370.9	454.6	536.8	288.7
Biological Fixation (kg/ha/yr)	78	57	91	1
Average N applied to whole farm kg/ha/yr	208 (219 to effluent and non-effluent pasture)	20 (17 to pasture)	168 (189 to pasture)	0

Table 7a: Biological fixation

	YE20	Proposed
Total Area (ha)	825.5	825.5
Biological Fixation (kg/ha/yr)	66	60
Average N applied to whole farm kg/ha/yr	104 (108 to pasture)	109 (123 to pasture)

Pasture Production

16. The average effluent N inputs for the YE20 models for Fawna was 95 kgN/ha from liquid and solid effluent to 67 ha of pasture (see table 8 below). The average effluent N inputs for Proposed Fawna model was 56 kgN/ha from liquid and solid effluent to 158 ha of pasture.

17. Fertiliser inputs of N, for the combination of the YE20 model for Fawna, to effluent and non-effluent pasture was 219 kgN/ha (see Table 8 below). The fertiliser inputs of N to pasture onto effluent and non-effluent area was 189 kgN/ha pasture in the Fawna Proposed model (see Table 8 below).

18. Liquid effluent is applied onto the dairy pasture blocks for the Fawna YE20 and Fawna Prop models, throughout the year, using a 12-24 mm application method. Solid effluent, from the pond, was applied September to April to the effluent blocks only and separated solids spread in December to all the pasture blocks (including effluent blocks) for Fawna YE20 and Proposed models.

19.

Table 8: Pasture production and N inputs (fertiliser and effluent)

	Fawna YE20	Fawna Prop
Effluent Liquid Area (ha)	67	158
Effluent Solids Area (ha)	330.0	476.6
Pasture Growth (tDM/ha/yr)		
Effluent	16.1	15.9
Non-Effluent	16.1	15.9
N Fertiliser inputs (kg/ha/yr)		
Effluent	219	189
Non-Effluent	219	189
N Effluent Inputs (kg/ha/yr)		
Effluent	95	56
Non-effluent (includes solids)	7	6
Total N Inputs (kgN/ha/yr)		
Effluent	314	244
Non-Effluent	226	195

20. The pasture production for all models have been modelled as varying based on topography, climate, and development status.

21. Fertiliser inputs of N are moderate for the combination of the YE20 models for Fawna and IFS and for the combined Proposed models for Fawna and IFS (see Tables 7a and 8).

22. It is assumed the combination of the YE20 models for Fawna and IFS represent the actual farm system with actual stock, crop area and fertiliser inputs, it is assumed that the pasture production is accurate and reasonable.

23. Long term pasture growth in Southland between 1979 and 2012 indicated that average pasture growth for newer pastures was 12.7T DM/ha/yr. Growth rates for Wallacetown were 14.3 tDM/ha for the 2019/2020 season allowing for 176 kgN/ha.

24. The dairy pasture production for the combination of the YE20 models for Fawna and IFS was 16.1 tDM/ha compared to 15.9 tDM/ha for the Proposed model which is respectively 26.8% and 20.1% higher than the Southland average. The dairy pasture production for the combination of the Fawna YE20 model was 16.1 tDM/ha compared to 15.9 tDM/ha for the Fawna Proposed model which is respectively 11.2% and 10.6% higher than the Wallacetown area average (see Tables 4 and 8 above).

25. The Fawna YE20 model: Allowing for the Overseer model assuming an average metabolisable energy (ME) value of 10.5 MJME/kgDM for pasture and South Island pastures have a ME value closer to 11 MJME/kgDM the models output of pasture growth would drop by 4.5%. Also, the model had used actual data and is assumed that pasture renewal has occurred, and new pasture

can account for a 15-20% improvement in pasture growth. Also 0.5 tDM/ha would come from the extra N fertiliser applied (43 kgN/ha X 12 kgDM/kgN applied). This more than accounts for the higher pasture growth.

26. Fawna Proposed model: The small drop in pasture growth can be accounted for in the 13.9 % decrease in N applied to pasture and 11.9% decrease in RSU/ha of pasture grazed by all animals.

27. The animal distribution is modelled as 'No difference between blocks' and 'Same as ratio of total animal intake '.

Mitigations Modelled

28. Reporting out lined the following: As described in the Nutrient Budget Report for Fawna Farms Ltd prepared Mo Topham (page 7 of the 'OverseerFM farm system modelling to support a consent application for expanded dairy), there are several mitigation measures indicated to mitigate N/P loss that have been included in the Proposed modelling. The below table details if the mitigation measures have been included in the proposed scenario and if they are accurately modelled.

Table 9: Mitigation option for Proposed scenario

Decrease in total RSU from the combined YE20 models to the combined Proposed models	No, according to the figures in OverseerFM the total RSU has increased by 243 (1.9%) or an increase Total RSU/ha from 16.3 RSU/effective ha to 22.5 RSU/effective ha (27.6% increase)
Decrease in grazing area	Yes the effective grazing area has decreased by 26% from 756.9 ha to 530.3 ha.
Decrease in RSU/ha in the dairy grazed pasture	Yes, the dairy RSU/ha of grazed pasture has increased slightly from 27.6 RSU/ha to 26.8 RSU/ha or a 2.9% decrease in RSU/ha.
Decrease in N applied to winter crops	Yes, N fertiliser applied to winter crops has decreased from rates of 117/138/175 kgN/ha to proposed levels of 90 kgN/ha to winter grazed crops
Removal of sheep and beef	Yes, there are no sheep or beef animals(other than breeding bulls) in the Proposed models
Decrease in P applied	Yes, well above maintenance P was applied to the Fawna YE20 model and slightly above maintenance was applied to the Fawna Proposed model.
Decrease in imported feed	Yes, there is expected to be 35.6% less supplement imported per hectare, and 20% more silage harvested in the Fawna Proposed model compared to the combination of the YE20 models

29. All mitigations identified in the OverseerFM report have been modelled correctly.

30. It is important that these mitigation measures are measured and monitored as if they are not adhered to the N loss reductions proposed may not occur.

31. Some good management practices assumed in Overseer are maintain accurate and auditable records of annual farm inputs, outputs and management practices (Overseer output is only as good as the data entered); Fertiliser is being applied according to the Fertmark and Spreadmark

Codes of Practice; Feed is stored to minimise leachate and soil damage; Compliant effluent systems as defined by DairyNZ; Stock exclusion from water ways; Irrigation efficiency greater than 80%; farm race and bridge/culvert nutrient runoff is directed to paddocks; grazing managed to minimise losses from critical source areas.

32. Overseer will account for bad practices such as nitrogen (N) applied that exceeds the plants' ability to absorb the excess N, application of N in the winter, high stocking rates, land left fallow between crops and irrigating high water application rates causing N drainage to name a few.

33. The Overseer modelling completed for this farm does not have any of the 'Bad Practices' as suggested in paragraph 32, and it would be assumed the FEMP would cover any good management practices (not limited to) outlined in paragraph 31.

CONCLUDING COMMENTS

Determination of the robustness of the nutrient loss to water

34. The questions below were described at Paragraph five of this report. Whilst these have been answered throughput this report, this section summarizes the answer to each question to make an overall conclusion about the robustness of the nutrient budgets.

Is the N loss consistent with what you would expect for an operation of this type and soils in this location?

35. Based on my experience, the N loss estimates are reasonably consistent with an operation of this scale and types of soils present.

Does the summary of inputs and outputs make sense? Especially clover fixation and change in block pools?

36. The Biological fixation for the combination of the YE20 models for Fawna and IFS is 66 kg/ha /year compared to the the combined Proposed models for Fawna and IFS at 60 kg/ha/year. This is a 9.1% decrease.

37. The N added to pasture for the combination of the YE20 models for Fawna and IFS was 108 kgN/ha compared to 123 kgN/ha for the combined Proposed models for Fawna and IFS (a 12.2 % increase in N used).

38. The decrease in biological fixation in the the combined Proposed models for Fawna and IFS can largely be explained by the 12.2 % increase in N fertiliser applied.

Check the 'Other values' block reports for rainfall, drainage, and PAW.

39. The rainfall and soil information have been entered based on protocols for the location and soil type selected. The combination of the YE20 Model soil areas are within acceptable marginal differences when compared to the combined Proposed model soils.

Production and stocking rate

40. Reviewing the NZ Dairy statistics for the 2019/2020 season, shows the average milk solids production on this property for the Fawna YE20 model at 465.3 kgMS/cow and 1266 kgMS/ha is respectively higher than the Southland Regional average of 414 kg MS/cow and higher than the Southland Regional average of 1,133 kgMS/ha. The Fawna Prop model at 387.1 kgMS/cow and 948 kgMS/ha are respectively lower than the Southland Regional average of 414 kg MS/cow and lower than the Southland Regional average of 1,133kgMS/ha.

41. The dairy cow stocking rate for Fawna YE20 and Fawna Prop models at 2.7 cows/ha and 2.5 cows/ha are both respectively lower than the Southland average for the 2019/2020 season of 2.71 cows/ha (Southland).

42. It is assumed that the Fawna YE 20 Dairy model was based on actual year end information.

Select the pasture production in the scenario report and check pasture growth.

43. Long term pasture growth in Southland between 1979 and 2012 indicated that average pasture growth for newer pastures was 12.7T DM/ha/yr. Growth rates for Wallacetown were 14.3 tDM/ha for the 2019/2020 season allowing for 176 kgN/ha.

44. The dairy pasture production for the combination of the YE20 models for Fawna and IFS was 16.1 tDM/ha compared to 15.9 tDM/ha for the Proposed model which is respectively 26.8% and 20.1% higher than the Southland average. The dairy pasture production for the combination of the Fawna YE20 model was 16.1 tDM/ha compared to 15.9 tDM/ha for the Fawna Proposed model which is respectively 11.2% and 10.6% higher than the Wallacetown area average.

45. The Fawna YE20 model: Allowing for the Overseer model assuming an average metabolisable energy (ME) value of 10.5 MJME/kgDM for pasture and South Island pastures have a ME value closer to 11 MJME/kgDM the models output of pasture growth would drop by 4.5%. Also, the model had used actual data and is assumed that pasture renewal has occurred, and new pasture can account for a 15-20% improvement in pasture growth. Also 0.5 tDM/ha would come from the extra N fertiliser applied (43 kgN/ha X 12 kgDM/kgN applied). This more than accounts for the higher pasture growth.

46. Fawna Proposed model: The small drop in pasture growth can be accounted for in the 13.9 % decrease in N applied to pasture and 11.9% decrease in RSU/ha of pasture grazed by all animals.

47. The animal distribution is modelled as ‘No difference between blocks’ and ‘Same as ratio of total animal intake ’.

48. I have assumed an adequate level of robustness around the YE20 models of actual Overseer Modelling as they are based on actual farming systems, and with that, I have assumed actual stock and fertiliser inputs used.

    The data input protocols have been followed with some deviations. This leads to a **high** level of robustness for the relevant input data for example, climate, soils, and pasture type. Based on this, I consider that the robustness of the nutrient loss estimates for the Proposed model to be **high.**

    Note: The Fawna YE20: Milking platform 19 20 (Dairy model) does have N fertiliser applied at 219 kg/ha which is greater than the 190 kgN/ha N Cap.

References:

https://www.dairynz.co.nz/publications/dairy-industry/new-zealand-dairy-statistics-2020-21/

Overseer Definition of Terms, previously Technical Note 6. May 2016
Overseer Technical Manual – Characteristics of Pasture, April 2015

Smith. L. C. 2012. Proceedings of the New Zealand Grassland Association 74: 147-152 (2012) *Long Term pasture growth patterns for Southland New Zealand: 1978-2012.* www.grassland.org.nz/publications/nzgrassland_publication_2284.pdf

https://www.dairynz.co.nz/media/5793235/average-pasture-growth-data-south-island-2020-v1.pdf

Attachment 3

Te Ao Marama Inc Submission

TE AO MARAMA INC.

16 December 2022

Consents Manager

Environment Southland

Private Bag 90116,

Invercargill 9810

Tēnā Koe,

RE: Submission on Resource consent application – APP-20222565

Please find attached a submission lodged, prepared for Oraka Aparima Rūnaka on Resource Consent applications for a suite of dairy consents including intensification of dairy in both land and cows by Fawna Farms Limited.

We trust the information contained within the submission is sufficient; however, should you wish to discuss any aspect further, please do not hesitate to contact me.

Nāhaku noa nā,

Stevie-Rae Blair

Te Ao Marama Inc.

Kaitohutohu Taiao

Form 13

To: Environment Southland

Private Bay 90116

Invercargill

1. This is a submission on the application (APP-20222565) for a suite of dairy consents at 1620 Ohai-Clifden Highway.

2. Oraka Aparima Rūnaka submission relates to the applications in their entirety (Appendix A). Oraka Aparima Rūnaka is **OPPOSED** to the granting of the applications.

3. Oraka Aparima Rūnaka does wish **TO BE HEARD** in support of its submission.

4. Oraka Aparima Rūnaka is not a trade competitor for the purposes of section 308B of the Resource Management Act 1991.

5. A copy of this submission has been sent to the applicant.

Signed for Oraka Aparima Rūnaka.

Stevie-Rae Blair

77 Don Street,

Invercargill

9810

Appendix A

Introduction

1. This submission is made on behalf of Oraka Aparima Rūnaka.

Papatipu Rūnaka

2. The Te Rūnaka o Ngāi Tahu Act 1996 (the TRoNT Act) and the Ngāi Tahu Claims Settlement Act 1998 (the Settlement Act) give recognition to the status of Papatipu Rūnaka as kaitiaki and mana whenua of the natural resources within their takiwā boundaries.
3. The consent application proposals relate to a suite of dairy consents that are within the takiwā of Oraka Aparima Rūnaka

General Position and Reasons for the Submission

4. To Ngāi Tahu, the land and water confers dignity and rank, provides the means of manaakitanga, is the resting place for the dead, a spiritual base for traditional beliefs and a heritage for future generations.

5. The creation and shaping of this landscape relate in time to the Takitimu waka and the great explorer Tamatea.[1]

6. In one account of creation of landscape, the Takitimu waka struck trouble and was eventually wrecked in Te Waewae Bay near the mouth of the Waimeha Stream. Tradition states that the Takitimu waka was overtaken by three large waves known as Ō-te-wao, Ō-roko and Ō-kaka, followed by a cross wave, which resulted in the Takitimu being hurled well inland, with its cargo being strewn about. In some accounts the ranges inland from Te Waewae Bay are likened to the huge waves that caused the demise of the waka Takitimu. In other accounts the Takitimu maunga are considered to be the upturned hull of the waka.

7. Ngāi Tahu is supportive of development within its takiwā, provided activities are undertaken in a way that respects the environment where the activity is to be undertaken and do not adversely affect Ngāi Tahu cultural values, customs and their traditional relationship with land and water.

[1] Tamatea-Ure-Haea (also known as Tamatea Pōkai Whenua, the explorer of land and Tamatea Pōkai Moana the explorer of oceans) (Garven, Nepia, & Ashwell, 1997; New Zealand Geographic Board, 1990)

8. All landscape is important to Ngāi Tahu, because of historical and contemporary associations. These associations include (but are not limited to) whakapapa, the formation of landscape, wāhi ingoa (place names), mahinga kai, kaimoana, wāhi tapū, Māori land, Mātaitai, and archaeological sites.

9. The cultural, spiritual, historic, and traditional association is recognised by the crown and is a Statutory Acknowledgement (See attachment 1) under the Ngāi Tahu Claims Settlement Act, 1997.

10. Oraka Aparima Rūnaka, as kaitiaki, are responsible as kaitiaki for protecting the mana and mauri of the environment that the application is within.

11. Ngā Rūnaka **opposes** the application for the following reasons:

    - The current state of the takiwā (wai, whenua and moana) is now seriously eroding our cultural health, wellbeing and cultural practices. There is a serious risk from intensification on the mauri of the water.
    - Potential adverse effects on cultural values, rights and interests. Oraka Aparima in 2019 released a position statement on stopping bovine intensification. The statement details that Rūnaka are implementing their kaitiaki responsibilities.
    - Intensive farming has been identified as the main contributor[2] to the deterioration of our waterways and we believe enabling further intensification impacts us achieving our kaitiaki responsibilities.
    - Rūnaka are concerned that the mitigation of planting forestry is not suitable. Rūnaka don't agree that the mitigation adds value to the application instead has significant risks albeit different from dairy support. This also relates to the mitigation not being a part of the land parcel that is being intensified.
    - Rūnaka are concerned around other mitigations and the effectiveness of these as well as the FEP and timelines within that document to provide any certainty around effects on water.
    - We recognise and appreciate that the farming community are trying to achieve better environmental practices, but this will not achieve the restoration required while further intensification is allowed to add to the cumulative effects on Papatūānuku.

[2] Snelder and Legard. 2014, Ewans 2018, Robertson et al. 2019

- There is no assessment of alternatives for example only adding extra land and no extra cows.
- Rūnaka are clearly concerned that the application does not provide for meaningful improvements in the health of the water or that hauora will be provided for.
- Papatipu Rūnanga have undertaken kaupapa Māori monitoring (Mātauranga informed) within the Orauea catchment both in 2016 and 2019 and this identified that whānau consider the overall health is poor/moderate.
- It is also unclear whether the application has assessed the hierarchy of obligations correctly under the National Policy Statement for Freshwater 2020.
- We have had consultation from the applicant over the application, however the application was drafted and ready to be lodged when contacted – hence the consultation is not considered meaningful engagement by mana whenua. While the applicant may have been willing to provide further consultation and potentially add mitigations, it was clear there was no movement on the activity.

Decision Sought

12. Oraka Aparima Rūnaka seek that there is:
    - The application is declined

Schedule 69 Statutory Acknowledgement for the Waiau Awa

Statutory area

The statutory area to which this statutory acknowledgement applies is the river known as Waiau, the location of which is shown on Allocation Plan MD 124 (SO 12263).

Preamble

Under section 206, the Crown acknowledges Te Rūnanga o Ngāi Tahu's statement of Ngāi Tahu's cultural, spiritual, historic, and traditional association to the Waiau, as set out below.

Ngāi Tahu association with the Waiau

The Waiau River features in the earliest of traditional accounts, and was a place and resource well known to the earliest tūpuna (ancestors) to visit the area. Rakaihautu and his followers traced the Waiau from its source in Te Ana-au (Lake Te Anau) and Motu-ua or Moturau (Lake Manapōuri), to its meeting with the sea at Te Wae Wae Bay.

The waka Takitimu, under the command of the rangatira (chief) Tamatea, was wrecked near the mouth of the Waiau River and the survivors who landed at the mouth named the river "Waiau" due to the swirling nature of its waters. Tamatea and his party made their way up the river to Lake Manapōuri where they established a camp site. The journey of Tamatea was bedevilled by the disappearance of Kaheraki who was betrothed to Kahungunu, a son of Tamatea. Kaheraki strayed away from the party, and was captured by the Maeroero (spirits of the mountain).

For Ngāi Tahu, traditions such as this represent the links between the cosmological world of the gods and present generations, these histories reinforce tribal identity and solidarity, and continuity between generations, and document the events which shaped the environment of Te Wai Pounamu and Ngāi Tahu as an iwi.

The Waiau has strong links with Waitaha who, following their arrival in the waka Uruao, populated and spread their influence over vast tracts of the South Island. They were the moa hunters, the original artisans of the land. There are remnants of Waitaha rock art associated with the river. Surviving rock art remnants are a particular taonga of the area, providing a unique record of the lives and beliefs of the people who travelled the river.

There is also a strong Ngāti Mamoe influence in this area of the country. Ngāti Mamoe absorbed and intermarried with the Waitaha and settled along the eastern coast of Te Wai Pounamu. The arrival of Ngāi Tahu in Te Wai Pounamu caused Ngāti Mamoe to become concentrated in the southern part of the island, with intermarriage between the two iwi occurring later than was the case further north. The result is that there is a greater degree of Ngāti Mamoe influence retained in this area than in other parts of the island. These are the three iwi who, through conflict and alliance, have merged in the whakapapa (genealogy) of Ngāi Tahu Whānui.

Numerous archaeological sites and wāhi taonga attest to the history of occupation and use of the river. These are places holding the memories, traditions, victories and defeats of Ngāi Tahu tūpuna. The main nohoanga (occupation site) on the Waiau was at the mouth and was called Te Tua a Hatu. The rangatira (chief) Te Wae Wae had his kāinga nohoanga on the left bank of the Waiau River mouth.

The Waiau, which once had the second largest flow of any river in New Zealand, had a huge influence on the lives and seasonal patterns of the people of Murihiku, over many generations. The river was a major mahinga kai: aruhe (fernroot), tī root, fish, tuna (eels), shellfish and tutu were gathered in the summer, a range of fish were caught in the autumn, kanakana (lamprey) were caught in the spring, while the people were largely reliant during winter on foods gathered and preserved earlier in the year. Rauri (reserves) were applied to the mahinga kai resources, so that people from one hapū or whānau never gathered kai from areas of another hapū or whānau. Some 200 species of plants and animals were utilised by Ngāi Tahu as a food resource in and near the Waiau.

The tūpuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of the Waiau, the relationship of people with the river and their dependence on it, and tikanga for the proper and sustainable utilisation of resources. All of these values remain important to Ngāi Tahu today.

Place names provide many indicators of the values associated with different areas, including Waiharakeke (flax), Papatōtara (tōtara logs or bark), Kirirua (a type of eel found in the lagoon), Te Rua o te Kaiamio (a rock shelter that was a “designated meeting place” for the local Māori, similar to a marae) and Kā Kerehu o Tamatea – (“charcoal from the fire of Tamatea” – black rocks near old Tuatapere ferry site).

The Waiau River was a major travelling route connecting Murihiku and Te Ara a Kiwa (Foveaux Strait) to Te Tai Poutini (the West Coast) and, as such, was an important link between hapū and iwi. Pounamu on the West Coast, and summer expeditions to Manapōuri (Motu-ua or Moturau) for mahinga kai were the main motivations for movement up and down the Waiau. Mōkihi (vessels made from raupō) were utilised for travel down the river and were a very effective and common mode of travel, making transportation of substantial loads of resources possible.

The tūpuna had an intimate knowledge of navigation, river routes, safe harbours and landing places, and the locations of food and other resources on the Waiau. The river was an integral part of a network of trails which were used in order to ensure the safest journey and incorporated locations along the way that were identified for activities including camping overnight and gathering kai. Knowledge of these trails continues to be held by whānau and hapū and is regarded as a taonga. The traditional mobile lifestyle of the people led to their dependence on the resources of the river.

The Waiau was once a large and powerful river, up to 500m across at the mouth, narrowing to 200m further upstream. The water flow from the Waiau River was an important factor in the ecological health and bio-diversity of the coastal resources.

The mauri of the Waiau represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life. All elements of the natural environment possess a life force, and all forms of life are related. Mauri is a critical element of the spiritual relationship of Ngāi Tahu Whānui with the river.

Attachment 4

Jenny Campbell & Dave Kennedy Submission

<u>Submission re Fawna Farms Ltd</u>

<u>To:</u> The Chief Executive

Environment Southland

Private Bag 90116

DX YX20175

Invercargill

From:

Coal Action Murihiku

c/- Co- convenors Jenny Campbell, Dave Kennedy,

Executive member Robina Johnston

c/-P O Box 71, 72 Devon St.

Mossburn 9747

03 248 6398

027 351 0180

jennycam@xtra.co.nz

18 December 2022

<u>He iti, He pounamu</u>
It may be small but it is very precious

Ko Oreti tōku awa
Ko Takitimu tōku maunga,
Ko Takitimu tōku waka
Ko Ngaitahu tōku iwi
Ko Te Rau Aroha tōku marae
No Mossburn tōku kainga
Ko Jenny Campbell ahau

He waka eke noa - We are all in this together.

Submitted online esconsents@es.govt.nz

Information from s95-95G Notification Document

<u>Sought Consents:</u>

The application **[reference APP-20222565]** is for the following resource consents to authorise proposed activities at 1620 Ohai-Clifden Highway:

- **Land Use Consent** to incorporate an additional 165.9 ha block of land into their existing dairy operations to increase the peak number of cows milked from 900 to 1,200 cows, and to use land for dairy farming that was not used for that purpose as of May 2016.
- **Discharge Permit** to discharge dairy shed effluent to land from 1,200 cows and to increase the existing effluent disposal area by approximately 23 ha (less normal buffers e.g., distances from water bodies, property boundaries, etc).
- **Water Permit** to take and use groundwater for the proposed expanded dairy operation and stock drinking water for 1,200 cows.
- **Land Use Consent** to convert land on farm to dairy farmland that was not used as dairy farmland prior to 2 September 2020 (Regulation 19 NES-F); and
- **Discharge Permit** to discharge contaminants associated to the use of land for dairy farming (Regulation 24 NES-F).
- As part of the application it is proposed to retire 288.7 ha of steeper contour land from pastoral farming, and to plant the land in *Pinus radiata* as a contaminant loss offset for the proposed dairy expansion

Effects & Issues

The application is for several activities. Associated with these activities there are a number of issues which we consider are significant. These include:

- Levels of nitrogen having an adverse effect on quality of groundwater
- Levels of nitrogen, phosphorus, sediment and microbial contaminants as a result of proposed activities having adverse effects on the quality of surface water, especially with regard to this property being in the Waiau River catchment
- Lower catchment of Waiau River adversely affected by cumulative effects of the proposed activities
- Cultural aspects along with the Mauri of the Waiau River being adversely affected by the proposed activities
- Impacts on soil structure and erosion caused by increased stock numbers.
- Proposed planting of *Pinus radiata* with all its associated issues around impacts on ground water, increase in soil acidity and wilding issues across adjacent farmland

Consequently we wish to comment on these pressing issues around this application.

General

Consent focus is still on more and more extraction from the natural environment we all share. This attitude also causes an increase in degradation and no meaningful mitigation to make a difference now.

Currently it seems a trend for dairy farms to buy more land is alarming, especially when the public's social licence is calling for a 30-50% reduction in dairying activity and as a nation we are supposed to reach a target of 70% reduction in Nitrogen & Phosphorous. Requiring more land to stock further isn't mitigating, it is profiteering from our human health which is in a crisis in Southland.

We are not confident that reducing nitrogenous fertiliser to less than 190kg/ha will be adequate to fully reverse the situation of a need for a 70% reduction in N & P, which we are in. Our regulators' measures aren't providing us with confidence that our communities and our planet will survive current and proposed dairy growth.

Being almost at the tipping point of our planet's existence there is no personal responsibility in this consent activity application. The extra farmland purchased should be to reduce pressure on the land, especially soils, as opposed to increasing stock units/ Ha.

External feed inputs needs to be zero annually for dairy farming. The farm needs to be a fully sustainable closed loop making all their own feed requirements. The intended purchase of more land could be used to ensure this is a self- sufficient property, not needing to import feed from other sources to the property.

Stock numbers should be decreased in fragile floodplains which are prone to compaction. Also establishing potentially greater buffers for heavier stock when soil moisture puts the carbon sink at risk is a need.

Degraded waterways in Murihiku

In light of this application I am very concerned about the current state of degraded waterbodies in Murihiku Southland including the deplorable state of the Waiau River which the streams from this property ultimately drain into. The degraded state of the Murihiku waterways and in particular the Waiau River, impacts negatively on the habitats of threatened native fish eg kōkopu- whitebait, tuna, and freshwater kōura. The very low flows in the Waiau has local people calling for an urgent need for improvement, with various polluting algal species such as rock snot already of grave concern.

The Waiau River is losing its Mauri as a result of continuing to allow water with contaminants to be flushed away in this body of water. More pollutants added all along the river are cumulative so another farm adding to this already impacted river, is not an option, when we know about the sacred value of water to Tikanga Māori in particular, as tangata whenua. Human and other animals' health is affected by polluted water and we have a responsibility to current and future generations of all living things. We are also bound by Te Tiriti o Waitangi principles.

Recent research shows the need for significant reductions in contaminant losses of nitrogen (N) phosphorus (P) and sediment are needed to improve the health of degraded waterways throughout Murihiku. Relevant science reports commissioned recently by Environment Southland for the People, Water and Land programme - Te Mana o te Tangata, te Wai, te Whenua indicate that N & P need to be reduced by 70% to meet the freshwater objectives in the next 25 years.

The Murihuku water resources are high in nitrate levels, with some areas very high at 16 mg/Lt to 22mg/Lt, that we know of.

Inputs on this farm need to be decreasing and should be reflected in the business' carbon emissions number.

With climate variation they are putting their business model at risk, if they do not plan for regular adverse events in this area known for its high rainfall, close to Fiordland National Park.

Mitigation

We consider that the proposed activities will result in more than minor effects in parts and the mitigations proposed are not sufficient to mitigate the negative effects on freshwater quality.

Inappropriate dairying is known to have significant negative effects on freshwater quality with any intensification of such activity at odds with efforts to improve freshwater quality in Southland.

The Southern region is the most suitable area to utilise the natural rainfall rather than extracting more from bores. Fewer stock units per hectare are required to meet our emissions reduction plan obviously. These mitigation techniques will help all farmers' sustainability.

Contaminant Mitigation

We consider the inadequate mitigation measures will not be able to deal with the additional effluent, N & P, being produced by these extra animals. It will be years before new plantings of recommended native vegetation species, are established. During this time, increased losses of contaminants will continue to degrade the catchment adding cumulative effects to an already stressed ecosystem.

Mitigation through wetlands and riparian strip plantings are very special habitats and long term mitigation methods but they need to be in the ground now and well established before these proposed extra dairying proposals are introduced.

We consider the proposal to mitigate using *Pinus radiata* is totally inappropriate in this area and especially in light of Government and other farmers and farming communities recognising the negative effects of planting non- native species. Across Aotearoa introduced species have degraded ecosystems by depleting soils, changing the pH to acid and increasing wilding issues on neighbouring properties. They also take land out of farming production opportunities which in turn affects the local communities by reducing the number of people employed on farms, affecting schools, community facilities and social well- being.

Groundwater quality

NZDWS nitrate levels are approx. 11mg/L at present but it is recommended that much lower nitrate levels, as occurs in eg Scandinavian countries at approx. < 2 mg/L, are needed in light of recent research.

Recent research has shown the connection between high nitrate levels in drinking water causing an increase in 'blue babies' and colo-rectal cancer. Murihiku has one of the highest rates of colo-rectal cancer in Aotearoa which reflects our high levels of artificial nitrogenous fertiliser use, especially on dairy farms.

Increase in cow numbers

Another aspect of grave concern is increasing the number of dairy cows in particular. We all know the impact of these on our waterways as outlined above along with the excessive methane production which is very dangerous in terms of climate change, even worse than CO_2.

Overstocking by dairying, which is beyond the carrying capacity of the individual farm is another major concern with the impact of trampling & compaction by large numbers of cows on our precious soils. Healthy soils are actually a vibrant living ecosystem. Compaction does not allow for all the organisms which normally live there, to survive let alone to thrive eg worms, invertebrates, beneficial bacteria, fungi … Healthy living soils are a huge carbon sink.

Climate Change & Emissions

We are writing this after our Emissions Reduction Plan has been announced, to ensure we keep our carbon emissions to such a level that our global warming does not exceed 1.5 deg Celcius. This takes all of us, including the dairy industry, to be cognisant of this and reduce their activities- not increase them. They are losing their social licence to operate.

This seems very applicable for this current consent application as we need to act *now*- on all fronts!

It is the cumulative effects on our environment of not only this proposal but of other operations in this area already which are major concerns of ours. It seems applications are pushing the current law to its limits, which is not helping our efforts to reduce our carbon emissions, methane levels and impacts on soils and water.

We recognise that the impact on climate change is not directly able to be assessed under the current RMA process, but we remain concerned that expanding dairy cow numbers will have a detrimental impact on the ability to reduce methane emissions in particular, to meet what is required under domestic and international agreements to keep warming below 1.5 degrees.

The resulting climate change if this goal is not met will have significant detrimental effects on Murihiku Southland. These effects include increasing severity of storms and flooding, droughts and unseasonal variations impacting the ongoing viability of activities such as farming.

Allowing an increase in dairy cow numbers will contribute more greenhouse gas emissions via methane emissions and nitrous oxide emissions. The effects of these have not been addressed by the application and are at odds with Environment Southland’s Draft Climate Action Plan 2020-2022 goal to support the Government’s goal of net zero greenhouse gas emissions by 2050 and Local Government Leaders’ Climate Change Declaration.

In summary

We must learn from our mistakes and not continue to make them as we strive to reduce our impact on our very fragile environment.

Titiro whakamuri, kōkiri whakamua

Look back and reflect so we can move forward.

We are not a trade competitor of the applicant (for the purposes of Section 308B of the Resource

Management Act 1991).

We do wish to be involved in any pre-hearing meeting that may be held for this application.

We have not served a copy of our submission on the applicant yet.

Relief sought:

We seek that the application is declined.

If the application is not declined then improved mitigation measures must be put in place that independent experts verify will not result in any increase in contaminants in the receiving waterbodies and the mitigation measures contribute to a reduction in existing contaminants by the time the proposed increased dairying activities commence.

Also very strict measures must be put in place if the pine plantation proposal is allowed to proceed, especially regarding wildings.

Hearing:- We do wish to be heard

Nāu te rourou, nāku te rourou, ka ora te iwi.

From your food basket and my food basket there is plenty for everyone.

Rangimarie e hoa.

J A Campbell

QSM for the Environment,

Attachment 5

Draft Consent Conditions

environment SOUTHLAND
REGIONAL COUNCIL
Te Taiao Tonga

Cnr North Road and Price Street
(Private Bag 90116
DX YX20175)
Invercargill

Telephone (03) 211 5115
Fax No. (03) 211 5252
Southland Freephone No. 0800 76 88 45

Discharge Permit

Under Section 104B of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Fawna Farms Limited** of **370 Mossburn Lumsden Highway, Castlerock, 9792** from **XX March 2023.**

Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.

Details of Permit

Purpose for which permit is granted:		To discharge agricultural effluent to land from up to 1200 cows via low-rate pods, travelling irrigator, slurry tanker or umbilical system
Location	- site locality	1620 Ohai Clifden Highway
	- map reference	NZTM2000 1201663E 4890884N
	- physiographic zone(s)	Bedrock/Hill Country, Gleyed & Oxidising
	- groundwater zone(s)	Unclassified
	- catchment	Waiau River
	- FMU	Waiau
Legal description of land at the site:		Lot 3 DP 340527; Pt Section 94 Waiau SD; Section 1 SO 452868 Section 18 Merrivale Settlement No 2; Pt Section 29 Blk IX Waiau SD; Pt Section 94 Waiau SD; Pt Section 94R Waiau SD; Pt Section 29 Blk IX Waiau SD; Section 16 Merrivale Settlement No 2; Section 110 Waiau SD; Pt Section 8 Blk IX Waiau SD
Expiry date:		**31 May 2030**

Schedule of Conditions

General conditions

1. This resource consent shall not be exercised until Discharge Permit AUTH-20146534-01-V2 is surrendered or has expired.

2. This consent shall be exercised in conjunction with Land Use Consent AUTH-20222565-03.

3. This consent authorises the discharge of dairy shed effluent ("agricultural effluent") onto land, via a land disposal system consisting of a stone trap, weeping wall and sludge beds and synthetically line effluent storage pond to low rate pods, travelling irrigator, umbilical system and slurry tanker, as described in the application (APP-20222565) for resource consent dated 6 October 2022. The activity shall be limited to:

   (a) the discharge to land of agricultural effluent generated from milking of up to 1200 cows up to twice per day;
   (b) the discharge to land of agricultural effluent via a high rate travelling irrigator and low rate pods system;
   (c) the discharge to land of agricultural effluent via a high rate umbilical system and slurry tanker as contingency measures;
   (d) the discharge of agricultural effluent to an area of 271.4 hectares as per the plan attached as Appendix 1;
   (e) the discharge of contaminants to land associated with the conversion of land on a farm to dairy farm land.

   Advice Note: *Routine monitoring inspections of this consent may occur up 2 times a year. This number does not include any other required inspections.*

4. Notwithstanding these conditions, this permit shall be exercised in accordance with the Collected Agricultural Effluent Management Plan. Where there is inconsistency between the Collected Agricultural Effluent Management Plan and the conditions of this consent, the conditions of this consent shall prevail.

5. The agricultural effluent discharge shall not exceed:

   (a) a depth of application of 10 millimetres for each individual application, and an instantaneous rate of 10 millimetres per hour via a low rate pod system;
   (b) a depth of application of 10 millimetres for each individual application via a travelling irrigator; and
   (c) a depth of application of 10 millimetres for each individual application via an umbilical system or slurry tanker.

6. Prior to the exercise of this consent, the Consent Holder shall:

   (a) measure the depth and instantaneous rate of application by the travelling irrigator as installed; and
   (b) supply these measurements to the Consent Authority.

7. The minimum return period for the discharge of agricultural effluent to land shall be 28 days.

8. The agricultural effluent discharge shall not occur when the moisture content of the soils is at or above field capacity.

9. Nitrogen loading onto any land area as a result of the exercise of this consent shall not exceed 150 kilograms of nitrogen per hectare per year.

Exclusions

10. This consent does not authorise the discharge of:

    (a) dairy shed effluent collected during 11 June to 24 July;
    (b) effluent collected by a feed pad, calving pad, wintering barn, silage storage facility or underpass.

11. No agricultural effluent discharge shall occur within:

    (a) 20 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; and
    (d) 20 metres from any property boundaries.

    Where there is inconsistency between the plan attached as Appendix 1 and the conditions of this consent, the conditions of this consent shall prevail.

12. The stored or discharged agricultural effluent shall not enter any surface watercourse in any way, including:

    (a) directly;
    (b) indirectly;
    (c) by overland flow;
    (d) via entrainment by stormwater or run-off; or
    (e) via a pipe.

13. The stored or discharged agricultural effluent shall not:

    (a) form ponds or flow on the land surface, or
    (b) cause contamination of water.

14. The stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site (see Appendix 1) that is offensive or objectionable in the opinion of the Council's Compliance Officer.

15. Spray drift beyond the boundary of the site shall not occur.

Effluent storage

16. The agricultural effluent discharge shall occur via an agricultural effluent storage facility of between 882 cubic metres *(Massey Pond calculator number)* and 4,590 cubic metres *(what they have or are going to build)* capacity.

17. The Consent Holder must maintain at least 500mm of freeboard in the agricultural effluent storage facility at all times.

System management

18. The Consent Holder shall notify the Consent Authority the identity of the Person in Charge of the agricultural effluent disposal system:

    (a) prior to the first exercise of this consent, and
    (b) no more than five working days following the appointment of any new Person in Charge.

19. The Consent Holder shall install and maintain:

    (a) an operational alarm that alerts the Person in Charge to any system failure that could cause the over-application, overflow or spilling of agricultural effluent (e.g. sudden pressure drop, irrigator stoppage); and / or
    (b) an operational automatic switch-off system that prevents any over-application or spilling of agricultural effluent.

20. Where the agricultural effluent reticulation system is installed in such a way that effluent can be siphoned when pumping ceases, the Consent Holder shall install and maintain an anti-siphon device in the agricultural effluent pipeline.

21. In the event of the failure or mismanagement of the agricultural effluent disposal system, or any other event that may result in a discharge of agricultural effluent that may have significant adverse effect on water quality, particularly in the region of the abstraction point of a registered drinking-water supply, the Consent Holder shall notify, as soon as reasonably practicable, the following:

    (a) the Consent Authority (ph 03 211 5115 or 03 211 5225 after hours); and
    (b) Southland District Council (ph. 0800 732 732).

Collected Agricultural Effluent Management Plan

22. Prior to the first exercise of this consent, the Consent Holder shall have and maintain a Collected Agricultural Effluent Management Plan. The Collected Agricultural Effluent Management Plan shall:

    (a) provide concise and clear direction to the Person in Charge and other staff on the operation of the agricultural effluent system;
    (b) identify environmental risks of agricultural effluent discharges specific to the farm including, but not limited to, locations of drains, surface waterways, sub-surface drainage and critical source areas in the agricultural effluent disposal area;
    (c) identify how the above environmental risks are avoided;
    (d) describe how each component of the agricultural effluent system is maintained and have regard to the information provided in the pond storage calculations provided in the application;
    (e) describe how agricultural effluent in storage is managed;
    (f) describe how agricultural effluent is managed when soils are at or above field capacity and/or during adverse weather conditions; and
    (g) describe how the stormwater diversion on the system is set up and managed.

23. Annually or more frequently, the Collected Agricultural Effluent Management Plan shall be reviewed and the outcome of the review provided to the Consent Authority within one month.

24. If amended at any time, the most recent version of the Collected Agricultural Effluent Management Plan shall be provided to the Consent Authority within one month of the amendment.

    Advice note: *The Collected Agricultural Effluent Management Plan required by Condition 22 may be incorporated into the Farm Environmental Management Plan required by AUTH-20222565-03, and prepared in accordance with Appendix N, of the proposed Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).*

Review of consent

25. 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, 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;
    (c) amending the monitoring programme to be undertaken;
    (d) adding or adjusting compliance limits;
    (e) ensuring the Waiau Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan or National Policy Statement for Freshwater Management; and
    (f) requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of this permit.

for the **Southland Regional Council**

Commissioner Alan Cubitt
Independent Hearing Commissioner

Notes:

1. *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, payable in advance on 1 July each year.*

2. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent will lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*

3. *In accordance with section 126 of the Resource Management Act, 1991, this consent may be cancelled by the Consent Authority if not exercised for a continuous period of 5 years or more.*

4. *The Consent Holder is reminded that they may apply at any time under Section 127 of the Act to have any condition of this consent changed except that which specifies the expiry date of this consent.*

5. *If you require a replacement permit upon the expiry date of this permit, any new application should be lodged at least 6 months prior to the expiry date of this permit. Applying at least 6 months before the expiry date may enable you to continue to exercise this permit until a decision is made, and any appeals are resolved, on the replacement application.*

6. *Dairy shed effluent should not be discharged onto any land area that has been grazed within the previous 5-10 days. Where there has been significant damage to soil during grazing, it is recommended that effluent not be applied until that damage has been repaired.*

7. *Measuring the moisture content of the soil to determine when the soils are at or above field capacity can be done by either actual monitoring on site or by reference to the appropriate Council monitoring site. The Council's soil moisture monitoring sites can be viewed at http://maps.es.govt.nz/ and following the "Soil Moisture Map" link.*

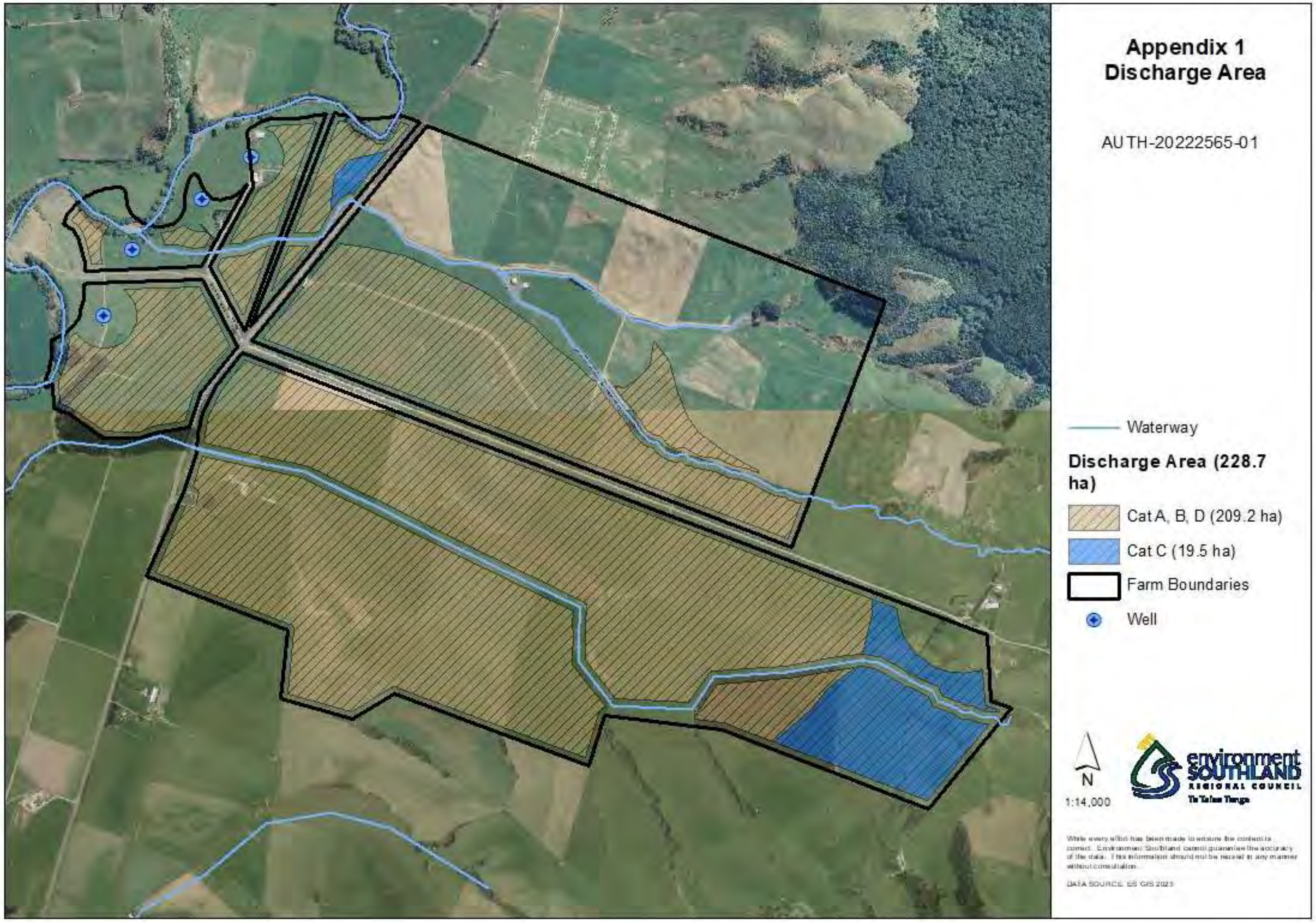
8. *Ponding is the accumulation of effluent on the soil surface resulting from the application of effluent to saturated soils, or the application of effluent inducing saturated soil conditions.*

9. *Extreme caution should be taken when applying nitrogen fertiliser to the effluent disposal area. It is recommended that a nutrient budget is used to check that nitrogen and potassium application rates to the effluent disposal area are not excessive.*

10. *The Consent Holder should display, in a prominent place in the dairy shed, a copy of the resource consent and relevant limits about the operation of the effluent disposal system that must be complied with.*

11. *Storage systems should be operated at low levels when conditions for effluent disposal are suitable in order to maintain storage for wet weather periods. In particular, storage systems should be emptied in late summer/early autumn to ensure sufficient storage capacity for the following late winter/early spring period.*

Appendix 1


Appendix 1
Discharge Area
AUTH-20222565-01
Waterway
Discharge Area (228.7 ha)
Cat A, B, D (209.2 ha)
Cat C (19.5 ha)
Farm Boundaries
Well
N
1:14,000
environment SOUTHLAND
REGIONAL COUNCIL
Te Taiao Tonga

Cnr North Road and Price Street
(Private Bag 90116
DX YX20175)
Invercargill

Telephone (03) 211 5115
Fax No. (03) 211 5252
Southland Freephone No. 0800 76 88 45

Water Permit

Under Section 104B of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Fawna Farms Limited** of **370 Mossburn Lumsden Highway, Castlerock, 9792** from **XX March 2023.**

Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.

Details of Permit

Purpose for which permit is granted:		To take and use groundwater for the purpose of stockwater and dairy shed use.
Location	- site locality	1620 Ohai Clifden Highway
	- map reference	D45/0316 1201548E 4890938N D45/0355 1200616E 4891852N D45/0349 1200769E 4891929N D45/0351 1200311E 4891492N
	- groundwater zone(s)	Unclassified
	- catchment	Waiau River
Legal description of land at the site:		Lot 3 DP 340527 & Pt Section 94 Waiau SD
Expiry date:		**31 May 2030**

Schedule of Conditions

1. This consent shall not be exercised until Water Permit AUTH-20202016 is surrendered or has expired.

2. This permit authorises the taking of groundwater at the location specified above. The rate of abstraction shall not exceed:

   (a) 2 litres per second;
   (b) 179,625 litres per day; and
   (c) 52,560,000 litres per year.

Advice Note

The Consent Holder must ensure that the bore that water abstraction occurs from can meet the following conditions:

The bore or well design and headwork's prevent:
(i) the infiltration of contaminants; and
(ii) the uncontrolled discharge or leakage of water to the ground surface or between aquifers.

Should the bore not meet the above conditions, the Consent Holder shall apply to the Consent Authority for a Resource Consent for the use and maintenance of the bore.

3. 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.

4.
   (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. There shall be a straight length of pipe on either side of the water meter, on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of five times the diameter of the pipe.

   (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 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.

5. 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.

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 2, should 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.

for the **Southland Regional Council**

Commissioner Alan Cubitt
Independent Hearing Commissioner

Notes:

1. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent shall lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*
2. *Section 126 of the Resource Management Act provides for this resource consent to be cancelled if the consent has been exercised in the past but has not been exercised during the preceding five years.*
3. *If you require a replacement permit upon the expiry date of this permit, any new application should be lodged at least six months prior to the expiry date of this permit. Applying at least six months before the expiry date may enable you to continue to exercise this permit until a decision is made, and any appeals are resolved, on the replacement application.*
4. *The Consent Holder shall pay an administration charge to the Consent Authority collected in accordance with Section 36 of the Resource Management Act, payable in advance on 1 July each year.*

AUTH-20222565-03

Cnr North Road and Price Street
(Private Bag 90116
DX XY20175)
Invercargill

Telephone (03) 211 5115
Fax No. (03) 211 5252
Southland Freephone No. 0800 76 88 45

Land Use Consent

Under Section 104B of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Fawna Farms Limited** of **370 Mossburn Lumsden Highway, Castlerock, 9792** from **XX March 2023.**

Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.

Details of Consent

Purpose for which permit is granted:	Use of land for farming
Location	- Unclassified - Waiau - Bedrock/Hill Country, Gleyed & Oxidising - Waiau River
Expiry date:	**31 May 2030**

Schedule of Conditions

1. Except as modified by conditions of resource consent, the activities authorised by this resource consent shall be carried out in general accordance with the application for resource consent (APP-20222565)[1] and all subsequent information provided during the application and the Farm Environmental Management Plan required by this consent.

2. For the avoidance of doubt, in the event that any inconsistency between the conditions of resource consent and the information and plans, including the Farm Environmental Management Plan (FEMP), submitted as part of the application, the conditions of resource consent shall prevail.

[1] Environment Southland Document ID: A833378

3. This consent shall be exercised in conjunction with Discharge Permit AUTH-20222565-01 and Water Permit AUTH-20222565-02 or any subsequent replacement permits.

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

4. The use of land for farming shall occur on the landholding at 1620 Ohai Clifden Highway, as shown on the plan attached as Appendix 1, and consisting of:

   (a) an existing block of land at or about map reference (NZTM 2000) 1201663E 4890884N and comprising Lot 3 DP 340527; Pt Section 94 Waiau SD; Section 1 SO 452868; Section 18 Merrivale Settlement No 2; Pt Section 29 Blk IX Waiau SD; Pt Section 94 Waiau SD; Pt Section 94R Waiau SD; Pt Section 29 Blk IX Waiau SD; Section 16 Merrivale Settlement No 2; Section 110 Waiau SD; Pt Section 8 Blk IX Waiau SD; and
   (b) a new block of land at or about map reference (NZTM 2000) 1200884 4893306 and comprising Lot 2 DP 7360; Lot 7 DP 7360; Lot 6 DP 7360; Lot 1 DP 7360; Lot 3 DP 7360; Lot 5 DP 7360; Lot 4 DP 7360; Section 250 Waiau SD.

5. The consent holder shall not commence expanded dairy activities on the block referred to in Condition 1(b) until:

   Commented [GG1]: Condition could be added which requires the applicant to respond to any potential changes on the forestry block (i.e. reducing stock numbers if the forestry activity changes)

   (a) a 288.7 hectare block marked as 'new plantation forest' as shown on the plan attached as Appendix 1 has been fully retired from pastoral grazing; and
   (b) date-stamped photos have been submitted to the Consent Authority (EScompliance@es.govt.nz) showing that the 288.7 hectare 'new plantation forest' referred to in (a) above has been fully planted in trees; and
   (c) confirmation has been received in writing from the Consent Authority that Condition 5(b) has been complied with. However, if this confirmation is not received within 10 working days of submission this will be taken as confirmation by the Consent Authority as compliance with Condition 2(b).

6. The farming activities shall be limited to:

   (a) a maximum milking herd of no more than 1,200 cows; and
   (b) a maximum of 300 R1 cattle, 285 R2 cattle and 25 mating bulls.

   Advice Note: *Milking age cows on the land refers to mature age milking cows on pasture paddocks, however if mature age milking cows are being quarantined outside of the winter barn to prevent contagious ailments from spreading, then this would not be considered a breach of the above rule.*

7. The Consent Holder shall notify the Consent Authority the identity of the Person in Charge of Valley View support block:

   (a) prior to the first exercise of this consent, and
   (b) no more than five working days following the appointment of any new Person in Charge.

Exclusions

8. Intensive winter grazing of stock on the land is limited to 53.7 ha of winter forage crop on the dairy platform grazed by mature age cows, R1s and R2s.

9. The landholding must not be grazed by mature aged female beef cows, mature age beef steers or sheep at any time of the year.

Advice note: *Intensive winter grazing is defined as the grazing of stock between May and September (inclusive) on forage crops (including brassica, beet and root vegetable crops), excluding pasture and cereal crops.*

10. Cultivation and intensive winter grazing shall not occur on a slope over 10 degrees.

Nutrient Management

11. The Consent Holder shall implement a soil testing regime to determine the soil fertility status over the landholding and to develop fertiliser recommendations based on the soil testing results.

12. The Consent Holder shall maintain a record of their soil testing regime, soil testing results and fertiliser recommendations required by Condition 11 within the Farm Environmental Management Plan.

13. The Consent Holder shall:

    (a) manage the application of fertiliser in accordance with:
        (i) The Code of Practice for Nutrient Management (With Emphasis of Fertiliser Use) Fertiliser Association, 2013, ISBN 978-0-47328345-2"; or
        (iii) any subsequent updates;

    (b) not apply fertiliser:
        (i) to land during the period 1 June - 31 July inclusive;
        (ii) within 10 m of a surface water body;
        (iii) within 10 m of any wetland boundary;
        (iv) within 20 m of any bore;
        (v) when soil temperature is at or below six degrees Celsius;
        (vi) when soil moisture capacity is exceeded; and
        (vii) directly to land within a riparian strip/margin.

    (c) not apply synthetic nitrogen fertiliser at a rate of more than 190 kg/ha/year on an individual hectare basis and as an average over the landholding.

14. The Consent Holder shall:

    (a) take representative soil samples at least once every two years and have those samples analysed for Olsen P by a laboratory with IANZ accreditation;
    (b) if Olsen P levels exceed a range of 26-32 the Consent Holder must reduce the amount of P fertiliser being applied to the landholding to ensure the risk of P loss is reduced; and
    (c) record the Olsen P results required by (a) and any fertiliser reduction required by (b) in their Farm Environmental Management Plan.

Nutrient Modelling

Commented [GG2]: In light of the Govt SAP review of the effectiveness of OVERSEER I will leave the inclusion of these conditions up to commissioners discretion

15. The Consent Holder must ensure that nitrogen and phosphorus losses to water from farming activities undertaken on the land are maintained at, or below the baseline contaminant loss rates of:

    (a) 54 kilograms per hectare per year nitrogen:
        (i) as estimated by the four-year rolling average loss rates using OVERSEER FM® version 6.5.0, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide.

    (b) 1.1 kilogram per hectare per year phosphorus:
        (i) as estimated by the four-year rolling average loss rates using OVERSEERFM® version 6.5.0, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide; and
        (ii) information from published New Zealand and Overseas research to estimate the additional phosphorus loss mitigation, beyond that modelled in Overseer, that is likely to occur as a result of the mitigation being implemented in accordance with the FEMP required under this resource consent.

    For the purposes of this resource consent, the four-year rolling average is defined as the average of the most recent four consecutive years' results starting from 1 July 2023.

16. Each and every year for the duration of this consent, using the current version of OverseerFM and in accordance with the generally accepted best practice modelling and the current Best Practice Data Input Standards, the Consent Holder shall:

    (a) model the nitrogen and phosphorus loss rates for the previous year from 1 July to 30 June inclusive;
    (b) calculate the four-year rolling average of nitrogen and phosphorus loss rates; and
    (c) re-model the baseline contaminant loss rates specified in condition 14 in the current version of Overseer.

17. The re-modelled baseline contaminant loss rates, modelled in accordance with Condition 16(c) shall supersede and replace the baseline contaminant loss rates specified in condition 15.

18. A report must be provided to the Consent Authority by 30 September each year summarising the results of Overseer nitrogen and phosphorus loss modelling required by condition 16. The report must include:

    (a) a review of the Overseer input data to ensure that the annual nutrient budget reflects the farming system;
    (b) an explanation of any differences between that nutrient budget and the annual nutrient budget of all previous years of farming undertaken under this consent;
    (c) a comparison of the four-year rolling average nitrogen and phosphorus losses with the applicable baseline contaminant loss rates; and
    (d) the names and summaries of the relevant qualifications and experience of the person(s) who prepared and (if relevant) reviewed the nutrient budget.

19. All nutrient loss modelling required by this consent must be undertaken by a person who is a Certified Nutrient Management Advisor (CNMA) under the Nutrient Management Advisor Certification Programme (NMACP).

20. The Consent Holder may use an alternative model that has been demonstrated to be equivalent to Overseer provided:

    (a) the evidence to demonstrate equivalence is provided to the Consent Authority at least six months prior to submitting the relevant annual report as required by condition 18; and
    (b) the use of the alternative model is approved by the Chief Executive of the Consent Authority.

Mitigation Measures

21. The Consent Holder shall undertake maintenance of the existing and any new dairy lanes to ensure they are contoured to ensure that any run-off occurs onto vegetated areas where it will not enter any surface water body.

22. The Consent Holder must manage the dairy lanes so that agricultural effluent and effluent sludges from the lanes does not:

    (a) accumulate in gateways;
    (b) accumulate in paddocks; or
    (c) result in the ponding, pooling, overland or lateral flow of any effluent or sludge beyond the dairy lane.

23. Prior to the exercise of this consent, the Consent Holder shall inspect all bridges and culverts and, where necessary, undertake improvements to the structures to ensure that there is no runoff of agricultural effluent to surface water.

24. Except for crossings of surface waterways, the Consent Holder shall not construct any new dairy lanes within 10 metres of a surface waterbody.

25. Any newly constructed dairy lanes shall have and maintain a 3 metre wide vegetated buffer to mitigate phosphorus run off to surface waterways.

Targeted Mitigations

Commented [GG3]: If consent was to be granted these conditions would require specific application related details.

26. The Consent Holder shall:

    (a) install any new permanent fencing of any unfenced or temporarily fenced surface waterbodies with a minimum 3-metre buffer, and written confirmation, along with date stamped photos, of the new fencing provided to the Consent Authority (EScompliance@es.govt.nz) by (date); and
    (b) plant approximately XXXm of riparian strips, and written confirmation, along with date stamped photos, of the riparian planting provided to the Consent Authority (EScompliance@es.govt.nz) by (date).

27. The Consent Holder shall:

    (a) permanently fence the Critical Source Area to exclude stock access, at or about NZTM2000 XXX, as per Appendix 2; and

(b) provide written confirmation, along with date stamped photos, of the permanently fenced Critical Source Area to the Consent Authority (EScompliance@es.govt.nz) by (date).

28. The Consent holder shall prepare and implement a Riparian Planting Plan for the farm that includes the use of native plants. This plan shall be prepared within six months, and begin being implemented within 12 months, of the consent being granted and be incorporated into the Consent Holder's Farm Environmental Management Plan required by Condition 33. The plan required by this condition shall be provided to Te Ao Marama Inc (office@tami.maori.nz).

29. The Riparian Planting Plan required by Condition 28 shall include, but not be limited to the areas below:

(a) the planting of 5.5ha area between the dairy shed and Gap creek at or about NZTM2000 1201609E 4890766N.
(b) the planting of both sides of the waterway that runs from (location), beginning at or about NZTM XXX and finishing at or about XXX, as per Appendix 2;
(c) the planting of both sides of the waterway that runs from (location), beginning at or about NZTM XXX and finishing at or about XXX, as per Appendix 2.

30. When stock are being break-fed and/or intensively winter grazed on the dairy platform/landholding, as described in Condition 8, the Consent Holder shall:

(a) back fence the stock to prevent stock entering previously grazed areas;
(b) progressively graze stock from the top of the slope to the bottom of the slope or leave a 20 metre 'last bite' strip at the base of the slope;
(c) use portable feeders when supplementary feed is used;
(d) provide transportable water troughs in or near the areas being grazed;
(e) ensure critical source areas within the area being grazed remain uncultivated and ungrazed;
(f) ensure that individual mob sizes being winter grazed do not exceed a maximum of 120 cattle; and
(g) a vegetated strip is maintained in, and stock excluded from the outer edge of the bed of any surface waterbody (excluding ephemeral rivers) and any wetland for a distance of at least 5 metres
(h) maintain a 10m buffer from all waterways to winter forage crops (grazed 1 May to 30 September), where the buffer will be uncultivated and retained in pasture.

31. Following intensive winter grazing on all areas of the landholding, the Consent Holder shall re-sow at the earliest opportunity based on paddock suitable conditions and as soon as practicable to minimise the amount of time that bare ground is exposed.

32. The Consent Holder shall cultivate;

(a) with the contour of the land being used for cultivation and shall not cultivate up and down the slope; and
(b) in accordance with Rule 25(a) of the Proposed Southland Water and Land Plan (Decisions Version), or any subsequent replacement versions.

Farm Environmental Management Plan

33. The Consent Holder shall have and maintain a Farm Environmental Management Plan (FEMP) for the landholding. The FEMP shall, in accordance with Appendix N of (Decisions Version) the Southland Water and Land Plan (or any replacement Appendix in an updated version of the plan), demonstrate how the following outcomes are to be achieved:

    (a) nutrients are used efficiently and nutrient loss to water is minimised;
    (b) contaminant losses from critical source areas are reduced;
    (c) cultivation is undertaken in a manner that minimises the movement of sediment and phosphorus to waterways;
    (d) intensive winter grazing occurs in a way that minimises the loss of sediment, phosphorus and microbiological contaminants to waterways;
    (e) agricultural effluent and other discharges are managed in a way that avoids or minimises the loss of contaminants to water. Irrigation water is applied to meet plant demands and minimises the risk of leaching and run-off;

34. The FEMP required by Condition 33 shall also include, but not be limited to:

    (a) a site map showing the location of critical source areas; physiographic zones; permanent or intermittent rivers, streams, lake, drains, ponds or wetlands; where known the location and depth of any subsurface drainage systems including outlets, riparian vegetation and fences adjacent to waterways and stock access points across waterways;
    (b) details of the implementation and maintenance of mitigation measures required by the conditions of this consent;
    (c) details of the implementation and maintenance of Good Management Practices, including adoption of changing industry good management practices. This includes where the implementation of these is to avoid, remedy or mitigate any farm specific environmental risks to water quality shown through any monitoring undertaken on the property voluntarily or as required by the conditions of this consent;
    (d) a review of the data obtained from the monitoring undertaken in accordance with the Farm Environmental Management Plan and any changes made, or to be made, as a consequence of that monitoring.

    ***Advice Note**: Should the use of a Freshwater Farm Plan be required or available, on the basis that it is certified under Section 217G of the Resource Management Act 1991 (as amended from time to time in accordance with Section 217E(2) or (3)) and available for use, the Consent Holder may elect to use such plan.*

35. The FEMP shall be reviewed at least once each milking season and can be modified at any time by the Consent Holder; and either:

    (a) an updated version shall be provided to the Consent Authority by 31 May each year; **or**
    (b) the Consent Holder must notify the Consent Authority in writing that no changes have been made by 30 September each year.

    Advice Note
    The results from the review of the FEMP will be assessed by the Consent Authority to ensure that the FEMP will still achieve the objectives specified in the FEMP and the FEMP has been prepared in accordance with Appendix N of the Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).

36. The Consent Holder shall operate in accordance with the FEMP at all times. Where there is inconsistency between the FEMP and the conditions of the consent, the conditions of this consent shall prevail.

Auditing

37. The Consent Authority may require the Consent Holder to have the farming activity as authorised by this consent independently audited, in accordance with Appendix 2, by a person who is a Certified Nutrient Management Advisor or Farm Environmental Plan Auditor or a Suitably Qualified Person who has demonstrated an equivalent level of expertise.

Lapse and Review

38. 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 cultural effects on the tangata whenua and/or 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; or
    (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;
    (c) amending the auditing/monitoring/recording/reporting/modelling programme to be undertaken;
    (d) adding or adjusting compliance limits;
    (e) ensuring the Waiau Freshwater Management Units meets the freshwater objectives and freshwater quality limits set in an operative regional plan or National Policy Statement for Freshwater Management; and
    (f) requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment as a result of the exercise of this permit.

for the **Southland Regional Council**

Commissioner Alan Cubitt
Independent Hearing Commissioner

Notes:

1. *Reporting to Council is required by conditions of your consent. The key dates for you to meet are listed below in Table 1:*

Due date	Condition number	Requirement
30 September (Annually)	18	A report must be provided to the Consent Authority by 30 September each year summarising the results of Overseer nitrogen and phosphorus loss modelling required by condition 16.
Plan submitted to Consent Authority within 6 months, and begin being implemented within 12 months of the consent being granted.	28	Consent holder shall prepare and implement a Riparian Planting Plan for the farm that includes the use of native plants.
31 May each year (Annually)	35	Updated FEMP.

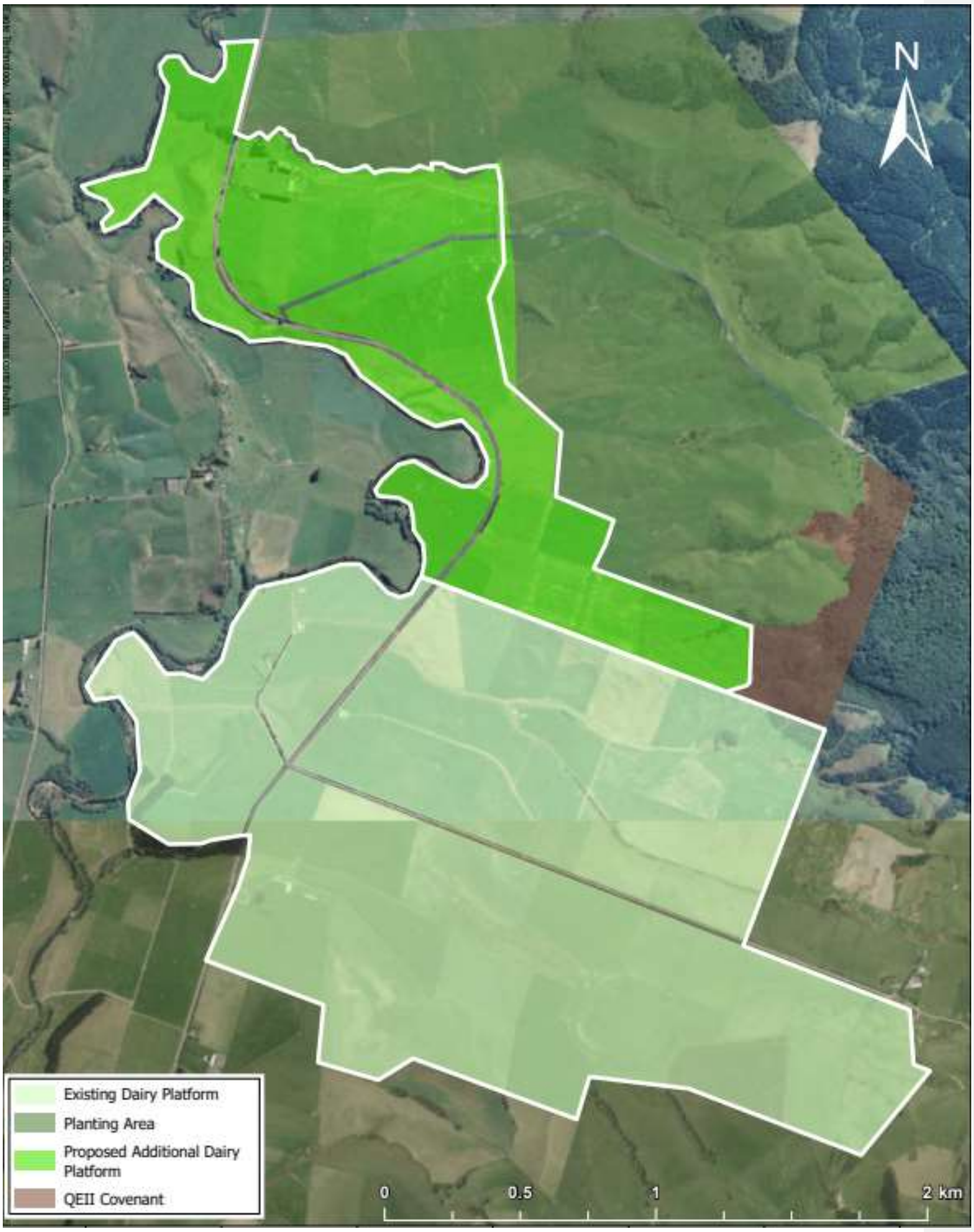
2. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent shall lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*

3. *In accordance with Section 138 of the Resource Management Act, this consent may be surrendered by providing written notice to the Consent Authority. This written notice must be accompanied with evidence to demonstrate that the conversion is complete and that all of the conditions of this permit have been satisfied in full.*

4. *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, payable in advance on 1 July each year. This charge may include the costs of inspecting the site up to two times each year (or otherwise as set by the Consent Authority's Annual Plan).*

5. *The FEMP, supporting evidence and on-site practices may be audited by the Consent Authority at any time for compliance and enforcement purposes.*

Appendix 1


N
Existing Dairy Platform
Planting Area
Proposed Additional Dairy Platform
QEII Covenant
0
0.5
1
2 km

Appendix 2: Auditing Criteria

1. The audit shall assess the performance of the farming activity occurring on the property against:

   (a) the objectives and good management practices specified in the FEMP;
   (b) any additional mitigation measures implemented on the property either voluntarily or as required by the conditions of this consent; and
   (c) the baseline contaminant loss rates specified in Condition 14 and 16.

Commented [GG4]: Remove if nutrient modelling conditions are not included

2. The audit must determine the level of confidence of achieving each objective set out in the FEMP. This level of confidence shall be categorised into the following:

   - **High** - the objective is probably being achieved
   - **Medium** - the objective is possibly being achieved
   - **Low** - it is unlikely that the objective is being achieved.

3. The audit shall record the justification for each level of confidence assessment, including noting the evidence, or lack of, used to make the determination.

4. Where an objective has received a Medium or Low level of confidence, the audit shall include the actions required for the farm to meet the objective and a timeframe whereby these actions need to be undertaken.

5. Where an objective has received a Medium level of confidence (and the farm has received no Lows), the audit shall also determine whether or not the farm is on-track to achieve the objectives.

6. The audit report shall be provided to the Consent Authority within three months of the date of the Consent Authority issuing a requirement to undertake the audit.

7. The frequency of audit requirements may be annually except where, for two consecutive years, an audit report has concluded that all objectives are probably being achieved (received a high level of confidence). In that situation no further audit will be required for at least three years.

8. Where the audit identifies actions required to be undertaken for the farm to meet the objective the Consent Holder must implement these actions within the timeframes stated in the audit.

9. Upon completion of any changes made and/or mitigations implemented as required by the audit, the Consent Holder shall confirm in writing, including photographs (date and time stamped) to the Consent Authority that these actions have been completed and implemented.

10. Upon completion of all the changes made and/or mitigations implemented as identified in the audit, the Consent Holder must ensure the measures are properly maintained, continue to function and are not removed or altered for the duration of this consent (and any subsequent variation versions).