

IN THE MATTER Of the Resource Management Act 1991

AND

IN THE MATTER OF A Resource Consent Application to discharge agricultural effluent to land from up to 840 cows, to take 85,800L/day of groundwater and to use land for two winter barns, a new agricultural effluent storage facility, and to establish a new dairy farm at 444 Springhills-Tussock Creek Road

BY Capil Grove Limited

REF APP-20222055

**STATEMENT OF SUPPLEMENTARY EVIDENCE OF HAMISH LOWE ON BEHALF OF
CAPIL GROVE LIMITED**

INTRODUCTION

1. My name is Hamish Lowe.
2. I have the qualifications and experience set out at paragraphs 17-24 of my statement of evidence in chief ("EIC") dated 23 May 2023. Of particular relevance to this statement is my certification as a Practicing Agriculturalist and a Certified Nutrient Management Advisor.
3. My supplementary evidence is given in response questions and further information sought by submitters and an exchange of technical information with one of the Environment Southland advisors.
4. I repeat the confirmation given in my EIC that I have read the 'Code of Conduct' for expert witnesses, now contained in the Environment Court Practice Note 2023 and that my evidence has been prepared in compliance with that Code.

SCOPE OF EVIDENCE

5. My supplementary evidence will address:
 - a. Requests from Ms Blair for further information regarding the Riparian Planting Plan;
 - b. Questions from Mr Edkins regarding the Overseer modelling; and
 - c. Revised suggested conditions to address the two issues above.

DETAILS OF MITIGATIONS

Overview

6. In the conditions attached to the evidence of Ms Blair, Te Ao Marama Incorporated (TAMI) sought further information about the function/operation of sediment traps, and details of the riparian planting plan.
7. I note that Ms Blair made minimal changes to the conditions that have already been through several iterations with them. I am appreciative of the effort and quick turn around that she and others in the TAMI team have made.
8. An issue that has come from the evidence exchange is clarification around the mitigation options. The discussions to date and the revised conditions have included:
 - Detention structures;
 - Riparian plantings; and
 - Sediment traps.
9. Farm specific details of these mitigation measures are detailed in our report titled: Contaminant Mitigation Measures for Farm 444. A copy of this report is attached as Annex A.
10. Of particular note is Table 6.4, repeated below:

Table 6.4: Summary of Phosphorus Reduction Method

Phosphorus Reduction Method	Total P reduction	
	(lower kg P/ha)	(Upper kg P/ha)
Detention structures	71	102
Sediment traps	11	32
Isolated riparian planting	1	8
Controlled grazing buffer	6	45
Total	89	187

11. The effectiveness of the proposed reductions are very good, especially when considering the conservative nature of the calculations used. Essentially total P mitigation suggest a range of reductions of 89 to 187 kg P/yr. This compares

favourably with a total Overseer projected loss of 640 kg/yr. Depending on the modelling scenario, Overseer results would suggest that the change from current land use (Stage 0) to future land use (Stage 4) would see a 0 to 4 kg P kg/yr increase, so these reductions highlight the effectiveness of mitigation methods, and the need for them to be included as consent conditions to ensure the catchment phosphorus load reduces.

Conditions

12. The conditions attached to the evidence of Ms Blair provide a commentary on outstanding conditions. Specifically:

- Land use - Condition 30 – a request has been made to use local plants. I have modified conditions to reflect the need for plants to be eco-sources. Regarding the detail for planting, this requirement is provided in the consent conditions in that a riparian plan shall be provide for comment prior to planting.
- Land use – Condition AC – a request has been made as to a better understanding of how sediment traps work. As noted above this work has been undertaken and the report is attached as Annex A. Additional wording has been added to the conditions to reflect the need for a planting plan, noting that this requirement is the same as the riparian planting plan.

OVERSEER MODELLING

13. In my evidence in chief, I noted that evidence of Mr Edkins had raised new issues and had sought clarification on a number of matters. Additional time was provided by the hearing panel for Mr Edkins and myself to conference and exchange views.
14. A number of Mr Edkin's comments came from having an understanding of the farming system. Many of these issues were traversed with the initial Overseer reviewer (Ms Watt) and time was needed with Mr Edkins to ensure there was a common understand of the farming system as, while the parts of which are not unique, bringing them together in one farming operation is not common.
15. I note that while modelling requires a set of basic principles to be followed, there are a range of personal styles and preferences. Differences in opinion are possible and often occur, which highlights some modelling is complex and there are a number of ways to achieve a similar outcome.
16. Mr Edkins had an initial reluctance with the modelling approach we had used. To assist with clarification he created his own version of the Stage 4 farm system. The result of this exercise was a remarkably similar result, being a nitrogen loss of 10,968 kg N/yr (32 kg N/ha) compared to my 10,730 kg N/yr (32 kg N/ha). Two memos discussing the changes and iterations, and the differences between the modelling, have been prepared and can be made available to the hearing panel if required.
17. There have been changes made to both the original farming model (Stage 0) and the proposed farming model (Stage 4). Changes include:
 - Partitioning of the milking herd;
 - Clarifying rainfall data;
 - Re-blocking and reducing the size of the barley crop;
 - Ensuring consistent fertiliser application across the barley split crops; and
 - Changing the number of years of permanent pasture prior to cultivation.
18. We agreed that the two models (Stage 0 and Stage 4) can be meaningfully compared and with the changes made provide for greater accuracy. It has been agreed that the important aspect of the relative difference in leaching between Stage 0 and Stage 4 still remain when compared to the original consent application.

19. We have agreed on a Stage 4 farming system with a nitrogen loss rate of 28 kg N/ha/yr.
20. It is worth noting the effort that Mr Edkins has put into achieving a consensus on the Overseer modelling. His perseverance is appreciated and is not often received when two parties are conferencing, especially for a farm system that is a little out of the box.
21. While I consider there are no outstanding issues with the modelling itself, there are limitations to Overseer modelling as discussed elsewhere in the evidence before the panel. I consider that the additional mitigation proposed (as described above and which is not taken into account through Overseer) provides additional confidence beyond the Overseer modelling alone that there will be reduction in nutrient losses from the proposed farm system when compared to the currently authorised system.

Hamish Lowe

27 June 2023

List of Annexures:

- **Annex A: Contaminant Mitigation Measures for Farm 444**
- **Annex B: Revised Consent Conditions – Table**

Annex A: Contaminant Mitigation Measures for Farm 444

Contaminant Mitigation Measures for Farm 444

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Contaminant Mitigation Measures for Farm 444

Capil Grove Limited

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

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1 EXECUTIVE SUMMARY

This report has been prepared to address potential mitigation strategies for phosphorus (P) losses from the proposed establishment of a dairy cow milking operation by Capil Grove Ltd (CGL) at 444 Springhills-Tussock Creek Road, Springhills in Southland. The farm is known as Farm 444.

OverseerFM modelling for Farm 444 suggests a small increase in P losses (approximately 9 kg P) when compared to the original mixed pastoral farm operation. CGL wishes to integrate a series of mitigation methods into the proposed operation to reduce P losses as well as nitrogen, sediment and E. Coli.

The employment of these methods will give effect to Te Mana o Te Wai principles with improved water quality and contribute to maintaining or enhancing catchment water quality.

The mitigation methods include:

- Detention structures;
- Riparian plantings; and
- Sediment traps.

All mitigation methods aim to slow or stop sediment load allowing for it to drop out of suspension in a water column. As phosphorus is typically associated with suspended material, settling of solids also removes phosphorus from the water column.

Research shows that detention structures, in particular detainment bunds, can reduce phosphorus losses by 47 to 68 %. Riparian buffers are also efficient at reducing phosphorus in runoff and from a range of 10 to 80 %. Re-fencing and allowing for greater buffer strips also results in significant reductions of phosphorus reaching surface water. Sediment traps can have removal efficiencies of up to 98%, however, 50 % could be considered more realistic depending on the design. Phosphorus reduction methods are summarised in Table 1.1.

Table 1.1: Summary of Phosphorus Reduction Method

Phosphorus Reduction Method	Total P reduction	
	(lower kg P/ha)	(Upper kg P/ha)
Detention structures	71	102
Sediment traps	11	32
Isolated riparian planting	1	8
Controlled grazing buffer	6	45
Total	89	187

With regard to total P mitigation effectiveness, Overseer modelling has suggested that the annual P loss from the farm of approximately 640 kg/yr. The range of reductions (89 to 187 kg P/yr) have a significant impact on the Overseer estimated farm loss, with 14 to 30 % reduction.

Overall, the report highlights the importance of implementing effective mitigation strategies to address P losses, and other contaminants associated, from farming activities – including the proposed dairy farm operation at Farm 444.



2 INTRODUCTION

2.1 Background

Capil Grove Ltd (CGL) owns a dairy support farm at 444 Springhills-Tussock Creek Road, Springhills in Southland. The farm is known as Farm 444. CGL has a consent to use Farm 444 for dairy support grazing, including the use of a wintering barn. This consent was granted on 25 June 2021.

CGL now wishes to establish a dairy cow milking operation by combining Farm 444 with adjacent properties which have been purchased. These properties were previously used for sheep farming, dairy support and beef farming, including winter grazing.

OverseerFM has been used to assess nutrient losses, which have a specific focus on N. Modelling suggests a reduction in N losses and a marginal increase in P losses.

A number of best management practices are already used on Farm 444 to assist with reducing nutrient losses from, many of which are captured within the OverseerFM modelling. However, additional measures can be employed to further reduce impacts on surface water. A selection of such methods have been suggested by Farm 444 as part of developing draft consent conditions. The following consent conditions have been proposed by Farm 444:

- *The Consent holder shall prepare and implement a Riparian Planting Plan for the farm that includes the use of native plants.*
- *The Consent Holder shall design and install sediment detention structures.*
- *The Consent Holder shall design and install wetland and sediment settling structures.*

These three mitigation methods are discussed in this report.

2.2 Scope of Report

There are four key contaminants from rural activities that can affect water quality, being: nitrogen (N), phosphorus (P), sediment and microbes.

This report identifies methods for managing predominately P losses via surface water. In the process of managing P, there is also likely to be a marked reduction in sediment and microbes, and to a lesser degree N.

Specifically, this report assesses the wider need to improved water quality, then describes methods that can be employed, their science and relevant research, and then applies examples to specific locations on Farm 444.



3 STATE OF NATIONAL GUIDANCE ON MITIGATION SOLUTIONS

Te Mana o Te Wai refers to the fundamental importance of water as the foundation of all decision-making for freshwater management. This is assisted by the National Policy Statement for Freshwater Management 2020 (NPS-FM 2020) as part of a national Essential Freshwater package being implemented by the Ministry for the Environment. It provides national direction which regional councils are translating into action on the ground through their regional policy statement and regional plans and city and district councils through their district plans. It replaces the NPS-FM 2017.

The NPS-FM 2020 is assisted by the National Environmental Standards for Freshwater (NES-F). The NES-F directs specific land use and water management to assist with improving water quality through the provision of rules.

Farm 444 is within Environment Southland's (ES) region. ES address activities that are allowed in Southland through their Regional Water Plan for Southland (2010) and the Proposed Southland Water and Land Plan (2021). The proposed plan addresses rules around new dairy farming which is relevant to Farm 444. Council will not grant consents unless they are happy that adverse effects and risks to water quality have been considered and will be managed. Further, the NES-F provides specific guidance on managing changing land use, specifically where new dairy farm operations are to be established.

CGL are planning to develop a dairy farm and this conversion has been deemed a discretionary activity. As part of the discretionary activity CGL must prove that there will be no increase in the contaminant loads entering the catchment, or more specifically there should be the maintenance or enhancement of surface waterways associated with the proposed land use. This objective can be assisted through employing a range of mitigation methods.

Although there are no specific rules and guidance requirements around mitigation solutions in the NES-F or regional plans, current and developing research has provided direction on how mitigation methods can be developed and the extent that the methods may improve water quality, or the extent of reducing the contaminant load to surface water.

ES does not have guidance around specific mitigation strategies that can be implemented on farms, with the exception of riparian planting Fact Sheets and Sediment Trap Construction.



4 FARM 444 PROPOSED MITIGATION

Currently, based on modelled OverseerFM (Overseer) losses, the proposed dairy cow milking operation will experience a 1.4% increase of P losses over Farm 444. This sees a total loss of 639 kg/P compared to a total loss of 630 kg/P for the current system. Therefore, a total of 9 kg P needs to be reduced to allow for a net zero change on Farm 444.

To put this loss in context, the total dynamic P pool sees 15,300 kg of P brought onto the farm. This means the loss rate of 630 kg P is in the order of 4 % the imported P.

For the proposed operation, Overseer has modelled a loss of 1.3 kg P/ha lost via runoff, 0.3 kg P/ha through direct losses (i.e. nutrient to water via drainage systems or directly from animals) and 0.2 kg/P/ha lost via leaching totalling an average loss of 1.9 kgP/ha. This breakdown is important as it helps to inform where there are the greatest opportunities to intercept and reduce losses.

Whist 444 Farm already implements best management practises to contribute towards improving water quality, implementation of further methods will be required with the new consent to further reduce P losses. As noted above, to reduce these losses, consent conditions have been proposed, whereby:

- The Consent holder shall prepare and implement a Riparian Planting Plan for the farm that includes the use of native plants.
- The Consent Holder shall design and install sediment detention structures.
- The Consent Holder shall design and install wetland and sediment settling structures.

It should be noted that these consent conditions have been proposed by CGL and the specific wording refined with input from Te Ao Marama Inc.



5 WHAT DOES THE SCIENCE TELL US

5.1 Overview

In general, runoff on a farm occurs when water from precipitation, irrigation, or other sources flows over the surface of the land and reaches surface water.

Several factors contribute to the occurrence of runoff on a farm:

- Slope and topography;
- Soil type;
- Rainfall intensity and duration;
- Vegetation cover; and
- Land management practices.

Runoff can carry with it various substances, such as sediment and nutrients, that can eventually make their way into nearby water bodies. However, if the speed (velocity) of the runoff can be reduced or stopped before it reaches a water body then sediment that has been carried in suspension will begin to drop out of the still water column. This process of settling is described by Stoke's law, being a mathematical approach to calculate the ability of particles in water to settle to the bottom of a water column.

P is typically bound to particles, being inert (soil) and organic (vegetation and waste material). P losses from agricultural land is closely aligned with sediment losses to waterways (Chris Smith & Muirhead, 2023). As such, minimising sediment transport to and within waterways can reduce the impact of P loss, thereby minimising impacts that P can have on waterways. Such impacts include eutrophication, toxic algal blooms, anoxic dead zones and altered food webs (Goeller et al., 2020).

Mitigation methods should aim to slow or stop sediment load allowing for it to drop out of suspension in a water column. This process therefore causes a reduction in sediment loads (including P which has adsorbed to sediment particles) entering downstream surface waterways. Three mitigation options and their efficiency have been summarised below.

5.2 Riparian Planting

McKergow et al., (2022) describes a riparian buffer as:

A strip of land which separates agricultural activity from a waterway. Buffers are usually fenced to exclude livestock and establishment of a permanent ground cover of vegetation is encouraged.

Riparian buffers utilize a combination of physical and biological processes to remove contaminants. The main processes are the infiltration of water and dissolved contaminants and the settling of particulates. It is to be noted that some fine particles such as clay may not settle readily due to clay's small particle size, hence the benefit where possible of relying on infiltration of the water carrying the clay.

Figure 5.1 illustrates the key processes responsible for filtering particulates in surface runoff passing through riparian buffers, and assisting with reducing dissolved and suspended nutrients.

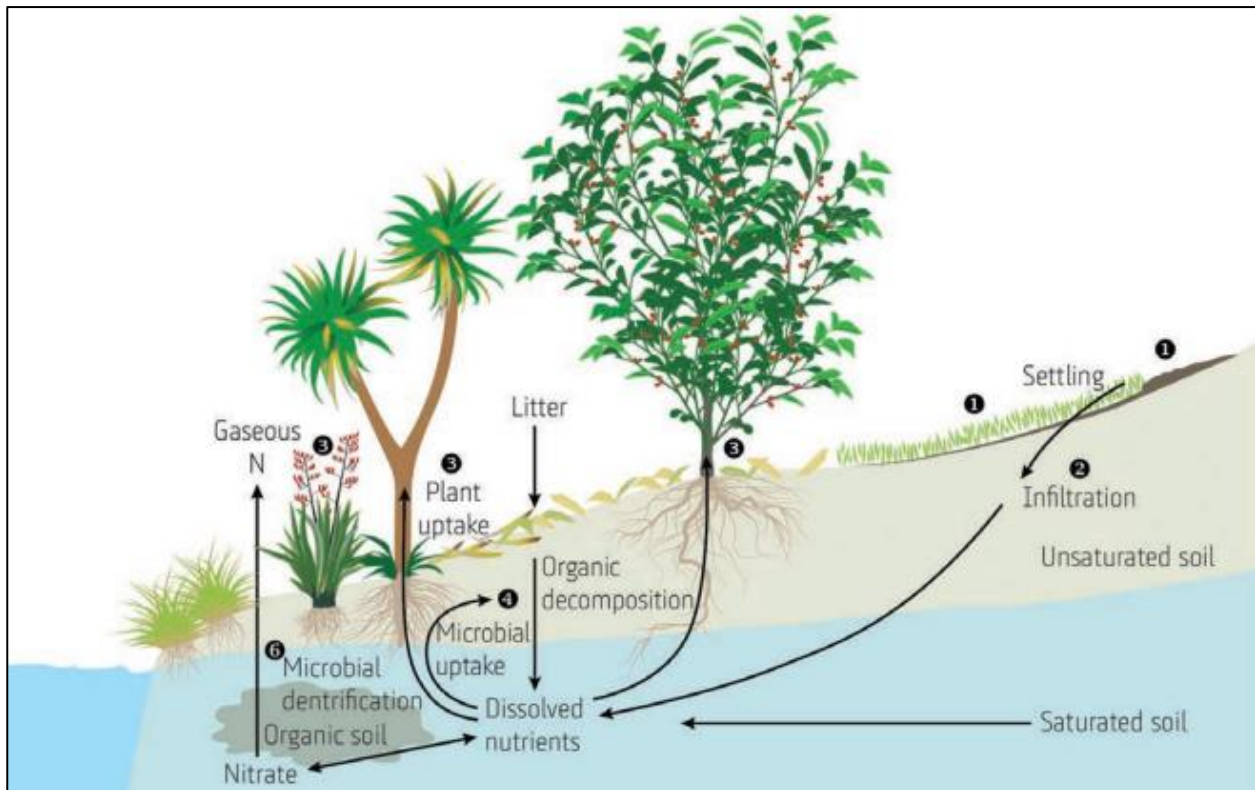


Figure 5.1: Main processes by which filter strips and planted riparian buffers retain suspended sediment and nutrients (NIWA, 2022)

Whilst numerous studies have shown that riparian planting reduces sediment, P and N losses to surface waterways, there is a large variability in these reductions due to riparian buffer design and the farm environment. This includes the type of vegetation planted, planting width, slope, topography and climate.

In general, the effectiveness of riparian buffers has been found to increase with increasing width and decreasing slope (Lee et al. 2004, Correll 2005, Mayer et al. 2007, Liu et al. 2008, Zhang et al. 2010).

The relative ability of riparian zones to then retain pollutants within the buffer is strongly linked to infiltration rate and storage capacity of buffer soils, vegetation and soil biota (Cooper et al. 1995, Gillingham and Thorrold 2000, Lee et al. 2000, Mankin et al. 2007, Mayer et al. 2007, Zhang et al. 2010).

Doole (2015) provides a summary of riparian studies that have been conducted in New Zealand. These studies also suggest that the width of the buffer and the exclusion of stock has an impact on reducing contaminants. The benefit estimates cover a range of scenarios and have been summarised in Table 5.1 below for N, P and sediment.



Table 5.1: Estimates for N, P and sediment for a range of buffer scenarios and sources (Doole, 2015).

Scenario	Percentage reduction			Source
	N	P	Sediment	
Fence out all stock	-	-	80	Palmer et al. (2013)
Fence out cattle only	-	-	30-90	McKergow et al. (2007)
Fence buffer 20 m	Additional 10–20% of mitigation achieved for fencing cattle out	Additional 15–30% of mitigation achieved for fencing cattle out	50-100	McKergow et al. (2007)
Fence out cattle only	7	10	40	Monaghan and Quinn (2010)
Fence out cattle and plant poplars	10	15	55	Monaghan and Quinn (2010)
Fence out all stock	15	15	50	Monaghan and Quinn (2010)
Fence out dairy cattle only	20	40	-	Monaghan et al. (2010)
Fence out all stock	10	30	-	Monaghan et al. (2010)
Fence out cattle only	18	39	60	Semadeni-Davies & Elliott (2012)
Fence out all stock	-	-	8	Daigneault (2015)
Fence out all stock	-	10-30	-	McDowell (2010)
Fence out all stock	23	24	24	Semadeni-Davies & Elliott (2012)
Grass buffer strips on free-draining soil	-	0-20	-	McDowell (2010)
Vegetated buffer strips	-	37-60	-	McDowell (2010)
Fence out all cattle	-	10-30	-	McDowell & Nash (2012)
Fence out all stock	-	55-60	20-25	McDowell et al. (2013)
Grass buffer strips	-	29-37	-	McDowell (2014)
Fence out all stock & 5m planted buffer	50	49	-	Zhang et al. (2010)
Fence out all stock & 10m planted buffer	73	71	-	Zhang et al. (2010)
Fence out all stock & 15m planted buffer	84	81	-	Zhang et al. (2010)
Fence out all stock & 5m planted buffer	9	-	46	Sweeney & Newbold (2014)
Fence out all stock & 10m planted buffer	18	-	63	Sweeney & Newbold (2014)
Fence out all stock & 15m planted buffer	26	-	72	Sweeney & Newbold (2014)



5.3 Detention Structures

A detention bund (DB) is a structure which impedes the flow of water and reduces its velocity. By virtue of reducing the velocity there is an increase in the time taken to travel a known distance, increasing the potential for sediment (and associated contaminants) to settle within the water column.

Typical detention structures allow for temporary ponding (ideally three days or less) and provide for sediment to drop out of the water column.

Paterson (2019) suggests that design and placement of detention bunding should allow for:

- Bunds placed in small catchments, ideally less than 42 ha;
- Volume of stormwater held is <math><5000\text{ m}^3</math>; and
- As a rule of thumb, the minimum storage:catchment ratio should be 120 m^3 storage per ha (120:1 ratio).

A detention bund's efficiency can be greatly enhanced by controlling the release of water from the structure. This should allow for the gradual release of water. A summary of how detention bunding structure works is described by Paterson (2019) and is repeated below:

The detention bund (DB) design utilises an upstand riser that is located at the low point of the ponding area. Connected to the upstand riser is an outlet pipe that passes through the bund, allowing for downstream discharge. The riser can release ponded water in two ways. First, it performs a skimming action when the pond height exceeds the height of the riser, enabling the uppermost layer of the ponded water to be decanted and released. Second, a restricted drain hole at the base of the upstand riser may be released to completely drain the pond. Participating farmers are tolerant of up to three days of ponding, since longer inundation results in pasture quality deterioration (J Paterson, pers. comm.) (See Figure 5.2 below).

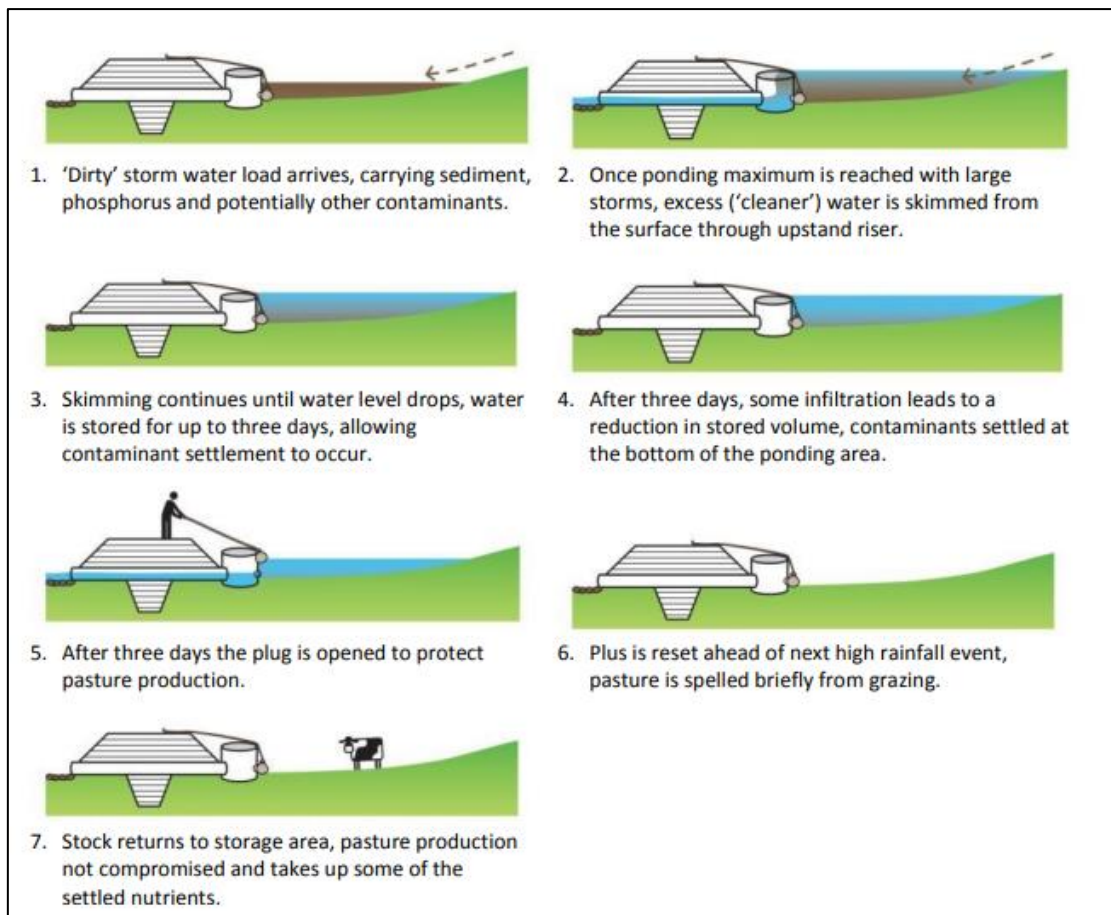


Figure 5.2: Main Processes of how a Detainment Bund Works (Paterson, 2019)

Research has shown that detention bunds can reduce annual suspended sediment loads by 51-59%, annual total P loads by 47-68% and annual total N loads by 57-72% (Levine, 2020). One of the key findings of Levine (2020) was that the contaminant removal performance of detention bunds is dependent on the infiltration capacity, or permeability, of the soils underlying the DB ponding area.

5.4 Sediment Traps

In-stream sediment traps such as wetland and sediment settling structures are excavations dug in the stream bed or large ponding areas designed to capture and retain sediment. These are described by McDowell & Nash (2012). When the trap becomes filled with sediment, it must be excavated from the stream. Sediment traps function by slowing the water velocity, allowing sediment to settle out of the water column (Smith & Muirhead, 2023). Coarse particles settle quickly, while finer silt and clay particles travel further and take a long time to settle. As P readily binds to fine particles, they have a disproportionately high impact on the receiving environment (McDowell & Nash, 2012). Therefore, the size of the sediment trap is important to ensure the water velocity is sufficiently slowed for effective sediment retention. In addition, establishing vegetation on the riparian margin assists with water retention, and aids in sediment trap success (Smith & Muirhead, 2023).

According to a recent review by Smith and Muirhead (2023), the effectiveness of sediment traps varies significantly, with sediment trap efficiency (STE) ranging from 10% to 98%. STE is defined as the percentage of sediment captured by the trap relative to the total amount of sediment entering the trap. On average, across agricultural catchments, the STE was found to be 59%.



Limited information regarding the effectiveness of coarse sediment traps in retaining P is available for New Zealand. McDowell et al. (2006) demonstrated a 10% decline in total P concentration in water discharged from a trap when compared to sediment-laden inflowing water from a stream that drains red deer wallows. However, the removal rate was lower than anticipated due to the higher concentration of P in fine suspended sediment rather than coarse sediment more readily captured by sediment traps.

Brown et al. (1981) investigated sediment and P removal efficiencies of a 3,400 m³ sediment-retention pond over a period of five years. The pond received surface water runoff from an irrigated land area spanning 4,050 hectares and removed between 65% and 76% of the sediment and 25% to 33% of the total P that entered the pond.

Overall, the efficiency of sediment traps of retaining sediment and reducing P is likely dependent on the soil type of surrounding catchment (McDowell & Wilcock, 2004). However, if the sediment trap is correctly sized and managed, it can conservatively be expected to capture 50% of the sediment load that would have entered the stream, resulting in at least a 10% reduction in P.

As a general guide, sediment traps should be 1.5 times the inflow channel width, 10 times as long and excavated 1.5 m below the stream bed (McDowell & Nash, 2012). In extension to this recommendation, a trial by the CAREX Group at the University of Canterbury's School of Biological Sciences set out to determine sediment trap size in order to retain approximately 50% of fine silt that travels through the trap (Harding & Meijer, 2021). The results are presented in Table 5.2 below.

Table 5.2: Sediment Trap Dimensions Based On Stream Width and Water Speed to remove 50 % of fine silt particles (from Harding & Meijer, 2021)

Sediment Trap Length x Depth	Average width (m)			
		<1.5	1.5-3.0	3.0-4.5
Water velocity (ms ⁻¹)	<0.2	4.0 x 0.5	7.0 x 0.75	9.0 x 1.0
	0.2-0.4	7.0 x 0.5	10.0 x 0.75	12.0 x 1.0
	0.4-0.6	10.0 x 0.5	13.0 x 0.75	15.0 x 1.0



6 APPLICATION TO FARM 444

6.1 General

CGL has an intention to use proven mitigation methods and science to reduce their runoff, in particular P losses on Farm 444. Mitigation methods and how they might apply to Farm 444 are described below.

6.2 Detainment Bund

For Farm 444's dairy conversion, proposed consent conditions have suggested the installation of two sediment detention structures. More structures could be used.

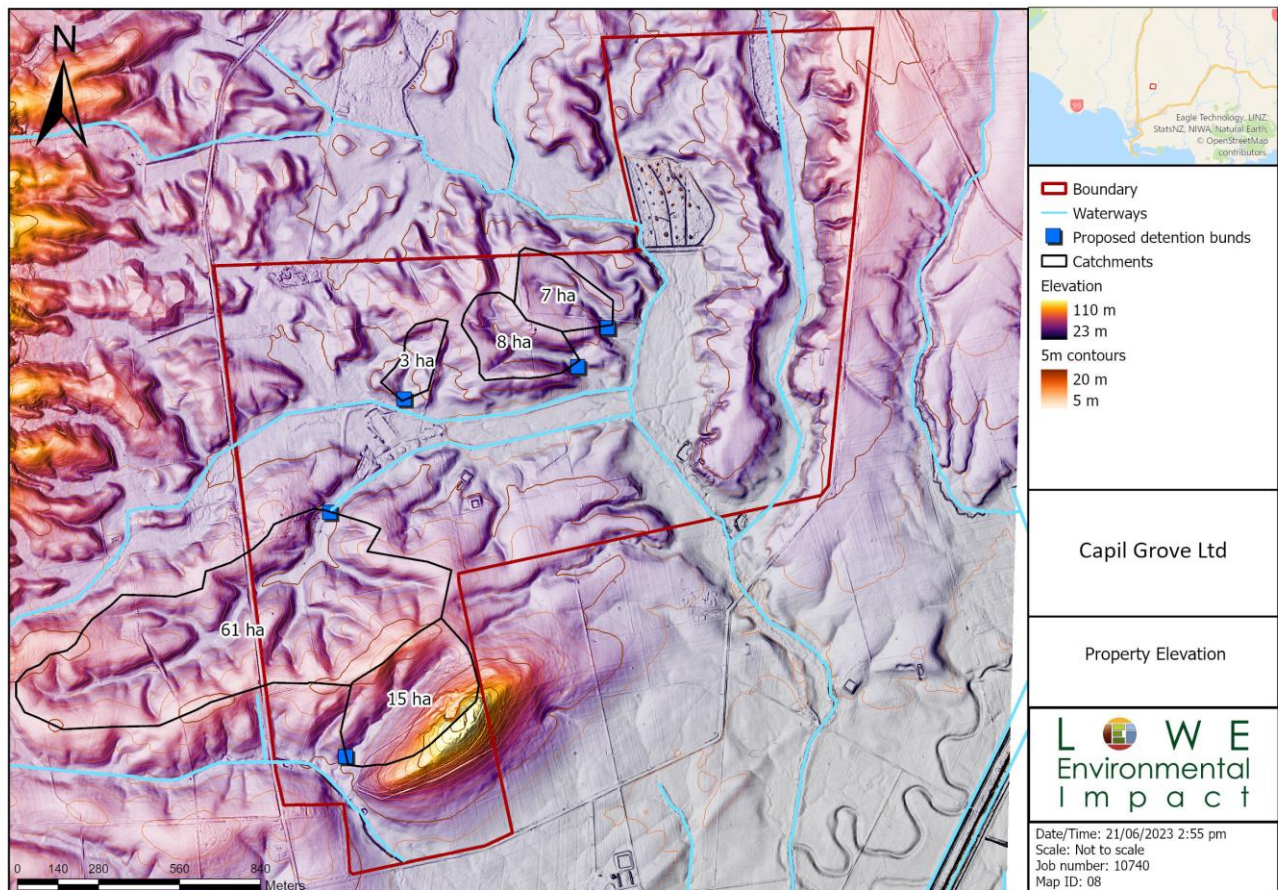


Figure 6.1 suggests the location of five possible structures along with the catchment areas up gradient of the structure.

The potential areas in Figure 6.1 have been assessed following the public release of LiDAR data in Southland.

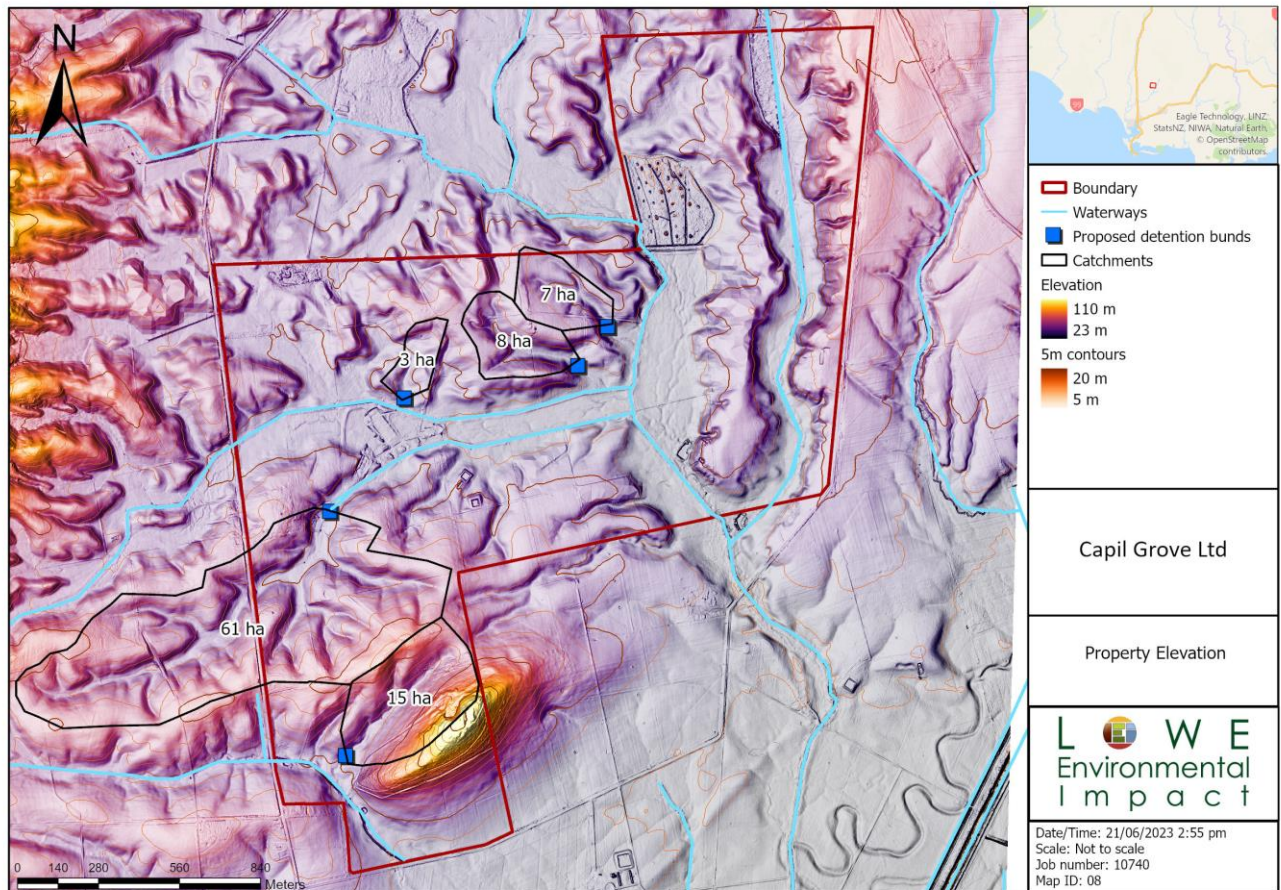


Figure 6.2 to Figure 6.6 show the general landscape where the five structures could be placed.



Figure 6.2: General landscape - 15 ha Proposed Detainment Bund



Figure 6.3: General landscape - 3 ha Proposed Detainment Bund

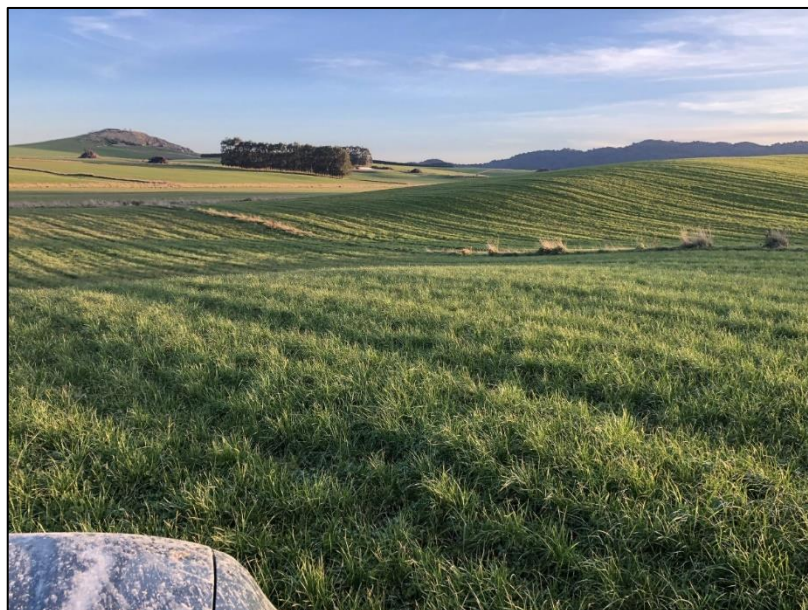


Figure 6.4: General landscape - 8 ha Proposed Detainment Bund



Figure 6.5: General landscape - 7 ha Proposed Detainment Bund



Figure 6.6: General landscape - 61 ha Proposed Detainment Bund

The specific details of the structures are yet to be developed, but they will essentially be a low earth bund that allows temporary ponding of water for several hours to no more than 4 days, depending on the rain event. The ponded water will gradually be released through the bund wall, but at a rate that provides for sediment settling within the ponded water.

As noted in section 3 above, the OverseerFM modelling suggests that the potential unmitigated load is 1.9 kg/ha. The leaching component should not apply, meaning that there is potentially 1.3 kg P/ha lost via runoff and 0.3 kg P/ha direct losses (i.e. nutrient to water via drainage systems or directly from animals), being a potential unmitigated loss of 1.6 kg P/ha.

Based on previous analysis provided in section 5.3 above, detention structures could result in 47 to 68 % reduction in P loads. The potential reduction for the 5 areas is described in Table 6.1.

Table 6.1 Potential Reduction in P Losses Using Detention Structures

Catchment	Area (ha)	Total P reduction
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		(kgP/ha @ 47 %)	(kgP/ha @ 68 %)
1	7	5	8
2	8	6	9
3	3	2	3
4	61	46	66
5	15	11	16
Total	94	71	102

The potential P reduction for the five nominated catchments is in the order of 71 to 102 kg P/ha. However, based on observations in Patterson (2019), as there are relatively fine textured soils present on the farm it is likely that the performances will be less than the described above. Should the effectiveness of the structures be reduced by 50 %, the performance will still mean that there will be in the order of 35 to 51 kg P/ha less P potentially entering surface waterways.

6.3 Sediment Traps

Sediment traps are effective to reduce particularly coarse sediment in waterways. Due to the fine textured soils on the property, settling of sediment will be most efficient with the use of very large detention ponds. Nevertheless, it is still expected that significant sediment loads can be captured and retained, which will reduce P loads in surface water.

Proposed sediment trap locations are outlined in Figure 6.7 and photos of these locations on farm are shown in Figure 6.8 to Figure 6.10. Additional detailing of stream's characteristics will be required before installation. Given the landform and drainage in the area, there is not sufficient certainty in the efficiency of the northern most proposed sediment trap (Figure 6.7) and has not been considered further in this assessment. However, at some stage in the future it may be developed into a standalone wetland.

Details for the sizing of sediment traps is provided in Table 5.2, with further detail provided in Harding and Meijer (2021). This table guides the creation of a sediment trap that has the ability to retain approximately 50% of fine silt, until the trap is half-filled. To develop a specific system there is the need to measure the stream's width and flow velocity, and with this information the trap shape can be determined. In general, they should have a rectangular shape, with a width 1.5 times that of the channel. Depth needs to be from 0.5 to 2 m depending on water volume and sediment quantity (Environment Southland, 2020). It is important to provide for convenient access for diggers to excavate the trap when it reaches capacity.

To prevent erosion of the trap banks (especially if diggers need to clean them out), it may be necessary to stabilize the banks with rocks. This is because erosion of the stream bank would result in the trap becoming filled with eroded material and not sediment. Additionally, planting vegetation along the stream's edges adjacent to the sediment trap is advised to further stabilize the stream's banks (Hudson, 2005).

NIWA's (2023) water quality website "Shiny" presents water quality information for catchments around New Zealand. It suggests that in the location of the two proposed in-stream sediment traps there is an estimated sediment load of 4.33 mg/L of suspended solids. This is consistent with water quality monitoring that has been done to date which suggests a range of <3 to 23 mg/L¹. It is noted that the results above are likely to be average values and not from periods of higher flow when there would be a much greater sediment load. Regardless an average of 3 mg/L can be used for a high level exercise of determining catchment sediment loss.

¹ Instream sampling has been undertaken from sites entering and existing the property on 10 November 2022 at 5 sites.



The combined stream flow is estimated to be 220 L/s (NIWA (2023) Shiny data). Based on visual observations this appears high and a flow of 100 L/s would be more typical. This equates to 9.5 T/yr of sediment that passes through the farm annually.

Smith and Muirhead (2023), sediment traps resulted in a 10% to 98% removal efficiency of sediment. From a management perspective, it may not be possible to remove 9.3 T/yr (98% efficiency), however, on a catchment scale, removing 1 to 3 T/yr of sediment that passes through the farm could be considered reasonable and would reduce sediment loading entering Farm 444 by 11 to 32 %. At a ratio of 10% (McDowell & Wilcock, 2004), the potential phosphorus removal could be 110 to 320 kg/yr. At a ratio of 1% P to sediment (NIWA (2023) Shiny data) the potential phosphorus removal could be 11 to 32 kgP/yr. For conservatism it would be appropriate to use the lower value.

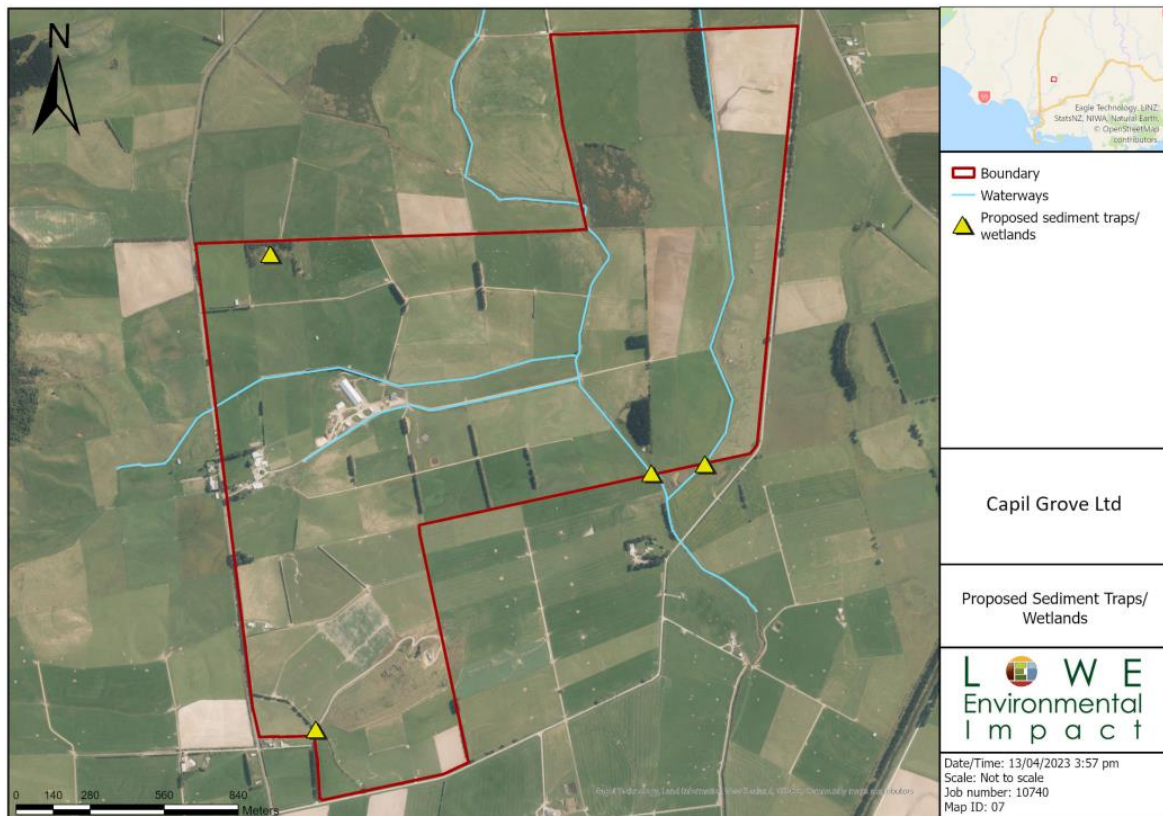


Figure 6.7: Proposed Sediment Traps Installation



Figure 6.8: Proposed Sediment Trap Location – Easternmost



Figure 6.9: Proposed Sediment Trap Location – East Side and South of Pine Tree Plantation



Figure 6.10: Proposed Sediment Trap Location – Southernmost

6.4 Riparian Planting and Buffer Strips

Farm 444 has made the conscious effort to fence all waterways on the farm. This is best practice and a dairy farming requirement. This fencing contributes to some degree by providing a small buffer strip that overland flow must pass through. The fencing is summarised in Table 5.1.

Simply fencing with minimal buffering is assumed in Overseer and is considered to be an inherent requirement of nutrient loss projections. The estimated Overseer loss of 1.9 kg P/ha has assumed that buffering is provided for. Therefore, to develop further reductions in nutrient losses, buffer strips need to be increased in size.

6.4.1 Localised Buffer Planting

Farm 444 are proposing to have isolated areas of more elaborate plantings with a wider buffer strip and larger permanent plantings. The locations of these areas are shown in Figure 6.11. To assist with planting, Environment Southland (2016) *Facts Sheets* provide guidance on planting. Potential plant species will include but are not limited to:

Lower bank

- Toetoe
- Pukio
- Red Tussock

Upper bank

- Flax
- Manuka
- Mingimingi
- Koromiko
- Cabbage tree

In sizing and developing the width of planting in the nominated areas, further guidance will be sought from *Getting Riparian Planting Right in Southland* (DairyNZ, 2014) which suggest that a wider setback is needed on steeper paddocks, longer paddocks and heavier soils. This is largely to increase the efficiency with faster flowing runoff. The DairyNZ guide also notes that on flat to undulating land, relatively small zones of 3-5 m are still capable of reducing nutrients, sediment and bacteria entering waterways.



Proposed riparian areas are outlined in Figure 6.11 below and photos of these locations on farm are shown in Figure 6.12 to Figure 6.15. These plantings are likely to give a degree of reduction as summarised in Table 6.2 Reduction Expected on Farm 444 With Isolated Riparian Planting below (noting that the reductions are based on information from Table 5.1 multiplied by the potential Overseer calculated runoff of 1.6 kg P/ha).

Table 6.2 Reduction Expected on Farm 444 With Isolated Riparian Planting

Catchment	Area (ha)	Total P reduction		
		(kgP/ha @ 10 %)	(kgP/ha @ 50 %)	(kgP/ha @ 80 %)
Old Pine Tree Plantation	0.4	0.064	0.32	0.512
Northernmost Planting	0.8	0.13	0.64	1.02
Centre Planting	1.8	0.29	1.44	2.3
Western Planting	3.6	0.58	2.88	4.6
Total	6.6	1.06	5.28	8.4

While the area upstream of the localised riparian planting is small, the small reductions contribute to total farm reductions.

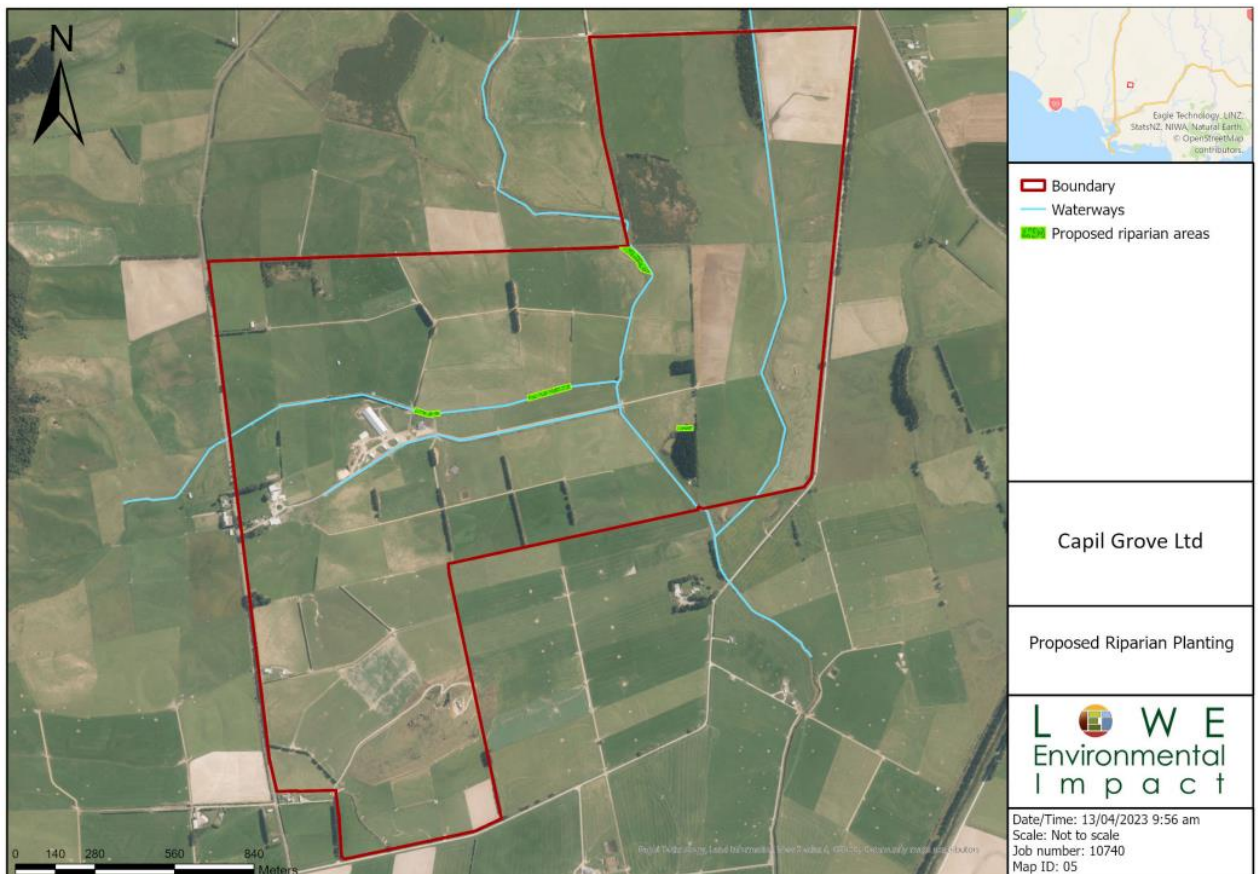


Figure 6.11: Proposed Riparian Areas



Figure 6.12: Proposed Riparian Planting – Old Pine Tree Plantation



Figure 6.13: Proposed Riparian Planting – Northernmost Riparian Planting



Figure 6.14: Proposed Riparian Planting – Centre Planting



Figure 6.15: Proposed Riparian Planting – Western Planting

6.4.2 Main Stem Drains Controlled Grazing Buffers

It is noted that under the nation-wide stock exclusion rules, all dairy cattle need to be excluded from all waterways with a bed wider than 1 m. Further, all new fences erected after 3 August, 2020 need to be a minimum of 3 m away from the waterway. Farm 444 has all waterways fenced, with buffers ranging from 1 m to more than 5 m in places.

Further to the localised buffer strips, Farm 444 are proposing to have controlled buffer grazing along their main drains. The location of these buffers are 3 m either side of the 'waterways' presented in blue in Figure 6.11.

Figure 6.16 displays the catchment area of the major waterways on Farm 444. These main waterways receive flow from minor streams and drains. If the minor stream catchments are removed, the remaining area will contribute directly to the major waterways, predominately by



overland flow. Therefore, the areas that the control grazing buffers apply to are directly adjacent to the main waterways.

There are a number of ways that a total combined catchment contributing to surface flow to the main drains could be determined. In this instance, GIS mapping has allowed a total stream length to be determined. It has then been assumed that a 30 m width either side of the main drains will contribute surface flow through the buffers. The length times the width enables the catchment area that will potentially pass over the Grazing Controlled Buffers. This area for the two main catchments is given in Table 6.3.

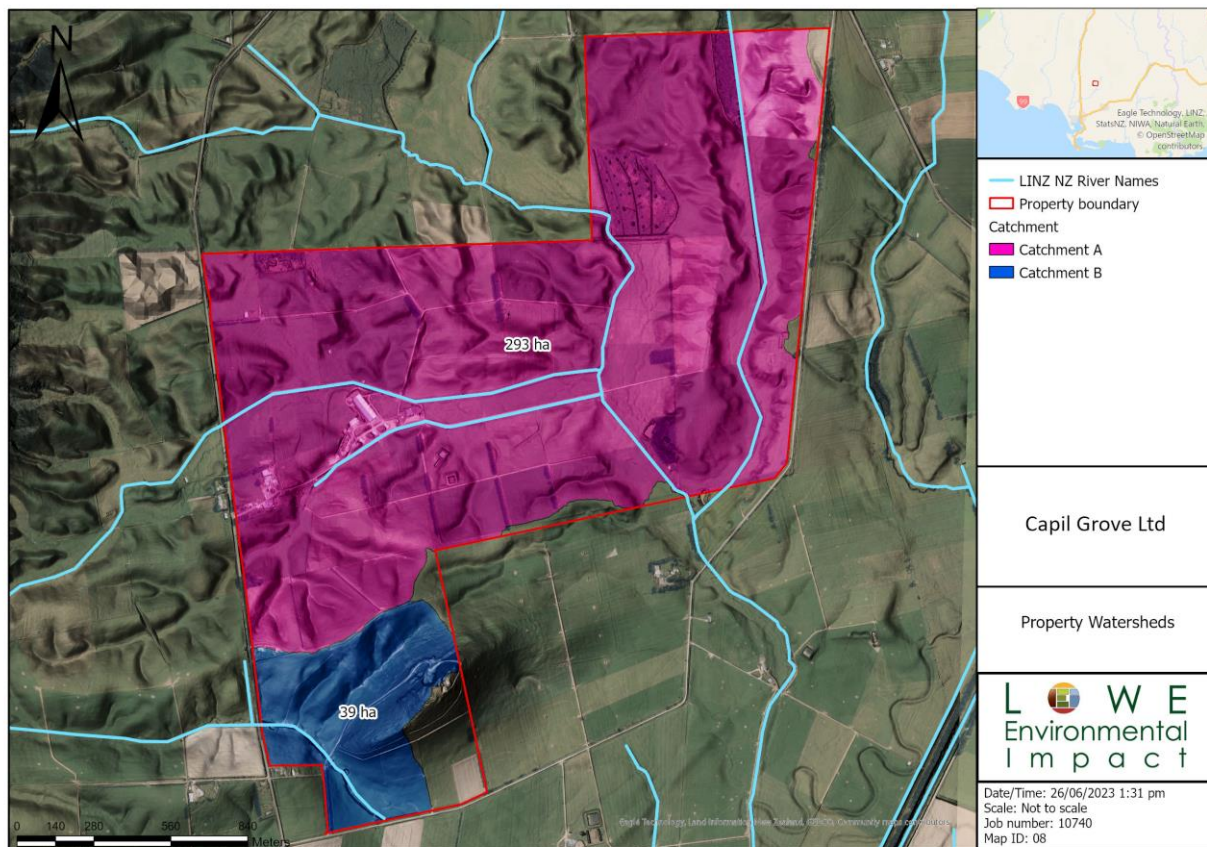


Figure 6.16: Catchment Areas of Major Waterways on Farm 444

The principle of the Controlled Grazing Buffers is to provide a parallel fence to the existing fence that typically excludes stock. However, when appropriate conditions exist, a gate can be opened to allow this buffer strip to be grazed. This essentially allows the same area to be used, but have stock excluded so the area that can be used to filter overland flow so that grass can assist to capture sediment (and phosphorus) when runoff conditions are likely. Suitable conditions for grazing will be during dry conditions when rain is not forecast.

Using a similar approach to that in Table 6.2, buffer strips are likely to give a degree of reduction as summarised in Table 6.3 below. The catchments are areas directly adjacent to the major waterways and does not include catchments serviced by smaller drains and streams. As with previous calculations, the reductions are based on information from Table 5.1 multiplied by the potential Overseer calculated runoff of 1.6 kg P/ha.

Table 6.3: Controlled Grazing Buffers Phosphorus Reduction

Catchment	Area (ha)	Total P reduction		
		(kg P/ha @ 10 %)	(kg P/ha @ 50 %)	(kg P/ha @ 80 %)



Catchment A (Drain length of 6,166 m x 30 m x 2)	31	5	25	40
Catchment B (Drain length of 594 m x 30 m x 2)	4	1	3	5
Total	35	6	28	45

6.5 Quantification of Impact of Mitigation

Table 6.4 below summarises a possible reduction in phosphorus loss to surface waters from employing the technologies detailed in the previous sections.

Table 6.4: Summary of Phosphorus Reduction

Method	Total P reduction	
	(lower kg P/ha)	(Upper kg P/ha)
Detention structures	71	102
Sediment traps	11	32
Isolated riparian planting	1	8
Controlled grazing buffer	6	45
Total	89	187

Table 6.4 above highlights the relative efficiencies of the various mitigation method. The assumptions and conservatism used to calculate these values should be noted, particularly with the sediment traps where low flows and low P concentrations have been used.

All structures contribute to an overall P reduction. Detention structures have a lot of potential and could be extended to other catchments if they proved successful. Depending on the P concentration sediment traps could be far more effective than indicated. While detention structures are more effective than riparian planting, the solution should ideally be a combination, as each focus on a different area of the farm and could be seen to be complementary.

One point to note is that care should be taken in adding the efficiencies of structures, with some methods servicing common catchments and there being the potential for some double counting. Regardless, the reduction values provide in Table 6.4 gives an indicative estimate of reductions in P loads to surface waters.

It is important to note that the actual impact of the proposed mitigation measures on Farm 444 would depend on the specific design, implementation, and site conditions. The estimates provided above offer a range of potential reductions in contaminant loads based on existing research. Site-specific assessments and monitoring would be necessary to determine the actual effectiveness of these mitigation measures on Farm 444.

With regard to total P mitigation effectiveness, Overseer modelling has suggested that the annual P loss from the farm of approximately 640 kg/yr. The range of reductions (89 to 187 kg P/yr) have a significant impact on the Overseer estimated farm loss, with 14 to 30 % reduction likely.

As a final note, although Farm 444 are aiming to reduce P losses through the use of the methods above, additional contaminant reductions, in particular N, sediment and microbes, can be achieved with the integration of these mitigation strategies.





7 CONCLUSION

There are a range of mitigation methods available to reduce P loads from Farm 444 to surface water. A selection of these methods has been considered with site specific opportunities developed.

The methods allow for a significant reduction in P (and other contaminant) losses, potentially accounting for 30 % of the total farm losses calculated by Overseer. The actual losses will be dependent on specific design, but regardless will contribute to a potential improvement in down stream water quality.

Overall, the report highlights the importance of implementing effective mitigation strategies to address P losses, and other contaminants associated, from farming activities – including the proposed dairy farm operation at Farm 444.



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Annex B: Revised Consent Conditions – Table

CONDITIONS RELATING TO CAPIL GROVE DAIRY FARM CONSENTS

The following tables step through the development of conditions including conditions recommended in s42a report, those proposed by CGL post-consultation, additional comments from TAMI in its submission, and the revised conditions now proposed by CGL taking all of these into account.

Draft Capil Grove – 444 Dairy Conversion - Land Use AUT2022022-04						
Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
1	This consent shall not be exercised until Land Use Consent AUTH-20211143-01 has been surrendered or expires.	1	This consent shall not be exercised until Land Use Consent AUTH-20211143-01 has been surrendered or expires.			
2	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-20222055) and all subsequent information provided during the application and the Farm Environmental Management Plan required by this consent.	2	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-20222055) and all subsequent information provided during the application and the Farm Environmental Management Plan required by this consent.			
3	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.	3	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.			
4	This consent shall be exercised in conjunction with Discharge Permit AUTH-20222055-01, Water Permit AUTH-20222055-02, Land Use Consent AUTH-20222055-03, and Land Use Consent AUTH-20222554, 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	This consent shall be exercised in conjunction with Discharge Permit AUTH-20222055-01, Water Permit AUTH-20222055-02, Land Use Consent AUTH-20222055-03, and Land Use Consent AUTH-20222554, 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.			
5	The use of land for farming shall occur on the landholding at 444 Springhills Tussock Creek Road, Springhills, as shown on the plan attached as Appendix 1, and comprising of Part Lot 2 DP 2005, Lot 1 DP 12811, Section 298 Forest Hill HUN, Lot 2 DP 13790, Lot 1 DP 4795, Section 517 Forest Hill HUN, Lot 3 DP 13790 and Lot 1 DP 13793, at or about map reference NZTM2000 1249823E 4872356N.	5	The use of land for farming shall occur on the landholding at 444 Springhills Tussock Creek Road, Springhills, as shown on the plan attached as Appendix 1, and comprising of Part Lot 2 DP 2005, Lot 1 DP 12811, Section 298 Forest Hill HUN, Lot 2 DP 13790, Lot 1 DP 4795, Section 517 Forest Hill HUN, Lot 3 DP 13790 and Lot 1 DP 13793, at or about map reference NZTM2000 1249823E 4872356N.			

Draft Capil Grove – 444 Dairy Conversion - Land Use AUT2022022-04						
Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
6	The farming activities shall be limited as follows: (a) a maximum milking herd of no more than 640 cows; (b) a maximum winter milking herd of no more than 640 cows; and (c) no milking age cows on the land during June and July (inclusive). 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 condition.	6	The farming activities shall be limited as follows: (a) a maximum milking herd of no more than 640 cows; and (b) a maximum winter milking herd of no more than 640 cows. 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 condition.			
-	[new]	7	During the months of May to September, should soil moisture at ES monitoring site [Makarewa aquifer at Mckinnon Road] be at field capacity for a period of more than 7 continuous days, then cows shall be held in the barn(s) for a minimum of 18 hours per day.	No further comments		
7	The Consent Holder shall notify the Consent Authority the identity of the Person in Charge of the dairy farming activity: (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	8	The Consent Holder shall notify the Consent Authority the identity of the Person in Charge of the dairy farming activity: (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			
8	The Consent Holder shall not graze any young dairy stock, defined as between 4 and 20 months old, on any part of the landholding.	9	The Consent Holder shall not graze any young dairy stock, defined as between 4 and 20 months old, on any part of the landholding.			
9	Cultivation shall not occur on any part of the landholding over 10 degrees slope.	10	Cultivation shall not occur on any part of the landholding over 10 degrees slope (see Appendix 1) unless as part of a pasture renewal programme.	No Further comment		
10	Intensive winter grazing shall not occur on any part of the landholding. 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.	11	Intensive winter grazing shall not occur on any part of the landholding. 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.			
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 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 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:	14	The Consent Holder shall: (a) manage the application of fertiliser in	No Further comment		

Draft Capil Grove – 444 Dairy Conversion - Land Use AUT2022022-04						
Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	(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 150 kg/ha/year on an individual hectare basis and as an average over the landholding.		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 a combined loading of organic material and synthetic nitrogen fertiliser at a rate of more than 210 kg/ha/year on an individual hectare basis and 190 kg/ha/yr 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 24 - 30 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 Condition 14(a) and any fertiliser reduction required by Condition 14(b) in their Farm Environmental Management Plan.	15	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 24 - 30 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 Condition 14(a) and any fertiliser reduction required by Condition 14(b) in their Farm Environmental Management Plan.			
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) 27 kilograms per hectare per year nitrogen; (i) as estimated by the four-year rolling average loss rates using OVERSEER FM® version 6.5.1 undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide. (b) 1.9 kilogram per hectare per year phosphorus; (i) as estimated by the four-year rolling average loss rates using OVERSEERFM® version 6.5.1, 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	16	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) 27 kilograms per hectare per year nitrogen; (i) as estimated by the four-year rolling average loss rates using OVERSEER FM® version 6.5.1 undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide. (b) 1.9 kilogram per hectare per year phosphorus; (i) as estimated by the four-year rolling average loss rates using OVERSEERFM® version 6.5.1, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide; and		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) 2827 kilograms per hectare per year nitrogen; (i) as estimated by the four-year rolling average loss rates using OVERSEER FM® version 6.5.1 undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide.	The nitrogen leaching loss has been adjusted to reflect the revisions as a result of the Overseer conferencing. It is worth noting that the Base Farm (Stage 0) loss rate also increased from 32 to 33 kg N/ha/y.

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Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	<p>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.</p> <p>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.</p>		<p>(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.</p> <p>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.</p>		<p>(b) 1.9 kilogram per hectare per year phosphorus;</p> <p>(i) as estimated by the four-year rolling average loss rates using OVERSEERFM® version 6.5.1, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide; and</p> <p>(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.</p> <p>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.</p>	
16	<p>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 15 in the current version of Overseer.</p>	17	<p>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 15 in the current version of Overseer.</p>			
17	<p>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.</p>	18	<p>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.</p>			
18	<p>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;</p>	19	<p>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:</p>			

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Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	(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.		(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	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.	21	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.			
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 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	The Consent Holder must use best endeavours manage the animal excreta to ensure it does not: (a) accumulate on laneways 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. Management of critical source areas, including laneways and gateways shall be identified and described in the FEMP as required by condition 34. Advice note: it is appreciated that there will be excreta on laneways and around gates, and the consent holder should ensure there is no direct	Support the draft condition proposed highlighted in yellow		The note from TAMI refers to the additional wording included after (c).

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Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
			runoff to waterways (i.e. runoff has to flow over a minimum of 10 m of vegetation before entering a waterway).			
23	Except for crossings of surface waterways, the Consent Holder shall not construct any new dairy lanes within 10 metres of a surface waterbody.	24	Except for crossings of surface waterways, the Consent Holder shall not construct any new dairy lanes that direct runoff towards or have a point of laneway runoff within 10 metres of a surface waterbody.	Support the changes made, highlighted in yellow, no further comment		The issue here is the laneways themselves, but the discharge of the runoff. These two aspects have been separated in the v6 condition.
24	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.	25	The Consent Holder shall inspect prior to the exercise of this consent, and then every 12 months, all bridges and culverts. Based on inspections, and where necessary, undertake improvements to the structures to ensure that there is no animal excreta runoff passing directly to surface water. Records of the inspection shall be kept and made available to the Council on request. The methodology for inspections and record keeping shall be set out in the FEMP as required in condition 33.	No further comment, comments have been included		Worth noting that that management requirements have been beefed up and more regular inspection is required.
25	The Consent Holder shall install any new permanent fencing of any temporarily fenced surface waterbodies with a minimum 3-metre buffer and provide written confirmation, along with date stamped photos, of the new fencing provided to the Consent Authority (EScompliance@es.govt.nz) by 1 July 2023.	26	The Consent Holder shall install any new permanent fencing of any temporarily fenced surface waterbodies with a minimum 3-metre buffer and provide written confirmation, along with date stamped photos, of the new fencing provided to the Consent Authority (EScompliance@es.govt.nz) by 1 July 2023.			
26	The Consent Holder shall: (a) construct a new winter barn, as detailed in the application, at or about NZTM2000 1250289E 4872287N; and (b) provide written confirmation, along with date stamped photos, of the fully operational winter barn to the Consent Authority (EScompliance@esgovt.nz) by 1 May 2024.	27	The Consent Holder shall: (a) Construct a new winter barn, as detailed in the application, at or about NZTM 1250289E 4872287N; and (b) Provide written confirmation, along with date stamped photos, of the fully operational winter barn to the Consent Authority (EScompliance@esgovt.nz) before the wintering barn is operational.			
	[new]	28	The Consent holder shall not allow more than 330 milking cows on the property until the second barn is built, as detailed in condition XX [above]			Condition added to avoid more cows being housed than can be accommodated.
27	Cows shall be housed in the winter barns, as authorised by AUTH-20222055-03, as follows: (a) no less than 80% of the then milking cow herd shall be housed in the barns from 1 May to 31 May, for no less than 24 hours per day, unless cows are temporarily removed to the dairy shed or yard; (b) no less than 100% of the then milking cow herd shall be housed in the barns from 1 June to 31 July, for no less than	-	[delete]	No further comment		

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Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	24 hours per day, unless cows are temporarily removed to the dairy shed or yard; and (c) no less than 90% of the then milking cow herd shall be housed in the barns from 1 August to 30 September, for no less than 24 hours per day, unless cows are temporarily removed to the dairy shed or yard.					
28	Daily use of the winter barn must be monitored by recording the number of cows and the number of hours spent in the barn. The records of winter barn use must be maintained and supplied to the Consent Authority upon request.	29	Daily use of the winter barn must be monitored by recording the number of cows and the number of hours spent in the barn. The records of winter barn use must be maintained and supplied to the Consent Authority upon request.			
29	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 34. The plan required by this condition shall be provided to Te Ao Marama Inc (office@tami.maori.nz).	30	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 6 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 XX. The plan required by this condition shall be provided to Te Ao Marama Inc. (office@tami.maori.nz).		The Consent holder shall prepare and implement a Riparian Planting Plan for the farm that includes the use of native plants. The Riparian Planting Plan shall be consistent with report titled “Contaminant Mitigation Measures for Farm 444” prepared by LEI (2023). The size of the plants used and planting methodology shall be noted. Where possible plants should be eco-sourced. This plan shall be prepared within 6 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 XX. The plan required by this condition shall be provided to Te Ao Marama Inc. (office@tami.maori.nz).	Have added a requirement for the Riparian Planting Plan to be consistent with the background reporting that has been prepared.
30	The Riparian Planting Plan required by Condition 29 shall include, but not be limited to the areas below: (a) the planting of both sides of the waterway that runs from at or about NZTM2000 1251517E 4873933N and finishing at or about 1251565E 4872301N, as per Appendix 2; (b) the planting of both sides of the waterway that runs from at or about NZTM2000 1251027E 4873269N and finishing at or about 1251376E 4872255N, as per Appendix 2; (c) the planting of both sides of the waterway that runs from at or about NZTM2000 1251069E 4872691N and finishing at or about 1249718E 4872471N, as per Appendix 2; (d) the planting of the duck pond areas at or about NZTM2000 1249898E 4873053N and 1251261E 4872475N;	31	The Riparian Planting Plan required by Condition xx shall include, but not be limited to plantings in the areas below: (a) at or about NZTM 1251517E 4873933N; (b) at or about NZTM 1251517E 4873933N; (c) at or about NZTM 1251517E 4873933N; (d) at or about NZTM 1251517E 4873933N; The areas above are shown on Figure X provided in Appendix 2.	Condition should stipulate native plants local to the area. The various areas sizes should be included. Support this condition but could need more detail such as size, amount of plants, spacing etc..	The Riparian Planting Plan required by Condition 30 shall include, but not be limited to plantings in the areas below: (a) at or about NZTM 1251311E 4872533N; (b) at or about NZTM 1251127E 4873123N; (c) at or about NZTM 1250830E 4872648N; (d) at or about NZTM 1250402E 4872564N. The areas above are shown on Figure 1 provided in Appendix A .	Additional wording has been added above to address TAMI comment. The map coordinates and figures references have been updated.

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Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	and (e) the planting of the 8 hectare peat wetland area referred to in the application as the gorse block, at or about NZTM2000 1251190E 4873343N, as per Appendix 2.					
	[new]	32	<p>The Consent Holder shall design and install sediment detention structures. The design and management of these will be detailed in the FEMP. The Consent Holder shall construct at least one structure within 12 months of this consent being granted, with at least a further one constructed within 24 months.</p> <p>Advice note: Potential locations for sediment traps are shown on Figure ? attached as Appendix 2 and include:</p> <ul style="list-style-type: none"> (a) in paddock X at or about NZTM 1251517E 4873933N; (b) in paddock X at or about NZTM 1251517E 4873933N; (c) in paddock X at or about NZTM 1251517E 4873933N; (d) in paddock X at or about NZTM 1251517E 4873933N; 	Support the inclusion of this condition	<p>The Consent Holder shall design and install sediment detention structures. The design shall be consistent with report titled "Contaminant Mitigation Measures for Farm 444" prepared by LEI (2023). The design and management of these will be detailed in the FEMP. The Consent Holder shall construct at least one structure within 12 months of this consent being granted, with at least a further one constructed within 24 months.</p> <p>Advice note: Potential locations for sediment traps are shown on Figure 1 attached as Appendix A and include:</p> <ul style="list-style-type: none"> (a) in paddock X at or about NZTM 1250884E 4872761N; (b) in paddock X at or about NZTM 1250985E 4872899N; (c) in paddock X at or about NZTM 1250287E 4872635N; (d) in paddock X at or about NZTM 1250040E 4872236N. 	<p>The map coordinates and figures references have been updated.</p> <p>Have added a requirement for the sediment detention structures to be consistent with the background reporting that has been prepared.</p>
	[new]	33	<p>The Consent Holder shall design and install wetland and sediment settling structures. The design and management of these will be detailed in the FEMP. The Consent Holder shall construct at least one structure within 12 months of this consent being granted, with at least a further one constructed within 24 months.</p> <p>Advice note: Potential locations for sediment traps are shown on Figure ? attached as Appendix ? and include:</p> <ul style="list-style-type: none"> (e) at or about NZTM 1251517E 4873933N; (f) at or about NZTM 1251517E 4873933N; (g) at or about NZTM 1251517E 4873933N; (h) at or about NZTM 1251517E 4873933N; 	Support the inclusion of this condition. Would like to understand how they will work as both sediment, filtration as well as biodiversity and habitat creation. Will there be planting around the wetland created areas	<p>The Consent Holder shall design and install wetland and sediment settling structures. The design shall be consistent with report titled "Contaminant Mitigation Measures for Farm 444" prepared by LEI (2023). The design and management of these will be detailed in the FEMP. The Consent Holder shall construct at least one structure within 12 months of this consent being granted, with at least a further one constructed within 24 months.</p> <p>Advice note: Potential locations for sediment traps are shown on Figure 1 attached as Appendix A and include:</p>	<p>The map coordinates and figures references have been updated.</p> <p>Have added a requirement for the sediment settling structures to be consistent with the background reporting that has been prepared.</p>

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Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
					(a) at or about NZTM 1251564E 4872297N; (b) at or about NZTM 1251363E 4872258N; (c) at or about NZTM 1250117E 4871258N.	
31	The Consent Holder shall: (a) design and install a sediment control structure within 12 months of the granting of this consent, at or about NZTM2000 XXXXXXXE XXXXXXXN; (b) design and install a second sediment control structure within 24 months of the granting of this consent, at or about NZTM2000 XXXXXXXE XXXXXXXN; (c) record the design and management of the sediment control structures in the Farm Environmental Management Plan required by Condition 34; and (d) provide written confirmation, along with date stamped photos, of the first fully operational sediment control structure to the Consent Authority (EScompliance@esgovt.nz) by [DATE] 2024 and the second fully operational sediment control structure by [DATE] 2025.	34	The Consent Holder shall: Record the design and management of the sediment control structures in required by conditions XX and XX Farm Environmental Management Plan required by Condition 34; and (d) provide written confirmation, along with date stamped photos, of the first fully operational sediment control structure to the Consent Authority (EScompliance@esgovt.nz) by [DATE] 2024 and the second fully operational sediment control structure by [DATE] 2025.			
32	The Consent Holder shall utilise plantain in their re-grassing programme. The plantain content shall be recommended by a suitably qualified seed representative and shall be detailed in the Farm Environmental Management Plan required by condition 34.	35	The Consent Holder shall utilise pasture species and available technologies that assist to reduce nutrient losses to water". Analysis of the suitability of available technologies shall be detailed in the FEMP required by Condition 33.			
33	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) no less than 5 metres from the outer edge of any surface water body or natural wetland unless for the purpose of renewing or establishing pasture in accordance with Rule 25(b) of the Proposed Southland Water and Land Plan (Decisions Version), or any subsequent replacement versions.	36	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) no less than 5 metres from the outer edge of any surface water body or natural wetland unless for the purpose of renewing or establishing pasture in accordance with Rule 25(b) of the Proposed Southland Water and Land Plan (Decisions Version), or any subsequent replacement versions.			
34	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;	37	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;			

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Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	(d) agricultural effluent and other discharges are managed in a way that avoids or minimises the loss of contaminants to water.		(d) agricultural effluent and other discharges, including excreta, are managed in a way that first avoids the loss of contaminants to water and otherwise minimises loss of contaminants to water in situations where losses can not be entirely avoided			
35	<p>The FEMP required by Condition 34 shall also include, but not be limited to:</p> <p>(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;</p> <p>(b) details of the implementation and maintenance of mitigation measures required by the conditions of this consent;</p> <p>(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.</p> <p>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.</p>	38	<p>The FEMP required by Condition 33 shall also include, but not be limited to:</p> <p>(?) a purpose statement detailing the intent of the FEMP and an overarching farm specific statement of intent as to how the environment should be managed;</p> <p>(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;</p> <p>(b) identification of the location, design and management mitigation devices, including:</p> <ul style="list-style-type: none"> (i) riparian planting; (ii) sediment detention structures; (iii) wetland and settling structures. <p>(c) A copy of the Riparian Planting Plan, required by Condition 29, providing the location and management of riparian planting. Details on pest weed and animal controls and infill planting shall be included;</p> <p>(d) details of the implementation, inspections and maintenance of mitigation measures required by the conditions of this consent, including but not limited to the devices listed above , managing runoff around critical source areas such as races, gateways, bridges, culverts, water troughs and shelter planting;</p> <p>(e) the identification of cropping and planting regimes that have the potential to assist with reducing nutrient leaching and runoff. This should include the use of plant species such as plantain;</p> <p>(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</p>	No further comment		

Draft Capil Grove – 444 Dairy Conversion - Land Use AUT2022022-04						
Section 42a report		Proposed CGL Post-consultation (v6)		TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6		Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
			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.			
36	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).	39	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).			
37	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.	40	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.			
38	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.	41	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.			
39	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:	42	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			

Draft Capil Grove – 444 Dairy Conversion - Land Use AUT2022022-04					
Section 42a report		Proposed CGL Post-consultation (v6)	TAMI Comments (v7)	Proposed CGL (v8)	Commentary on v8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	<p>(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</p> <p>(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;</p> <p>(c) amending the auditing/monitoring/recording/reporting/modelling programme to be undertaken;</p> <p>(d) adding or adjusting compliance limits;</p> <p>(e) ensuring the Ōreti 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</p> <p>(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.</p>	<p>relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:</p> <p>(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</p> <p>(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;</p> <p>(c) amending the auditing/monitoring/recording/reporting/modelling programme to be undertaken;</p> <p>(d) adding or adjusting compliance limits;</p> <p>(e) ensuring the Ōreti 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</p> <p>(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.</p>			

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	Commentary on V8
Recommended conditions from s42a report	Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v8)	Commentary on V8	
Recommended conditions from s42a report	These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments	
1	This resource consent shall not be exercised until Discharge Permit AUTH-20211143-02 is surrendered or has expired.	1	This resource consent shall not be exercised until Discharge Permit AUTH-20211143-02 is surrendered or has expired.		
2	This consent shall be exercised in conjunction with Land Use Consent AUTH-20222055-04 and Land Use Consent AUTH-20222554.	2	This consent shall be exercised in conjunction with Land Use Consent AUTH-20222055-04 and Land Use Consent AUTH-20222554.		
3	<p>This consent authorises the discharge of dairy shed effluent, wintering barn effluent and silage pad effluent (“agricultural effluent”) onto land, via a land disposal system consisting of a stone trap, sump, weeping wall and sludge bed, winter barn weeping wall, winter barn sump 1 and sump 2 and two synthetically lined effluent storage ponds to low rate pods and slurry tanker, as described in the application (APP-20222055) for resource consent dated 5 April 20221 , additional application dated 27 April 20222 , additional AEE dated 27 April 20223 and additional information responses dated 6 September 2022 and 17 September 20224 . The activity shall be limited to:</p> <p>(a) the discharge to land of agricultural effluent generated from milking of up to 640 cows up to twice per day; (b) the discharge to land of agricultural effluent via a low rate pod system and a high rate slurry tanker; (c) the discharge of agricultural effluent to an area of 272 hectares, as per the plan attached as Appendix 1; (d) the discharge of effluent from a silage storage facility no larger than XXXX m3 ; (e) the discharge to land of winter barn effluent generated from the use of two winter barns between 1 May and 30 September (inclusive).</p>	3	<p>This consent authorises the discharge of dairy shed effluent, wintering barn effluent and silage pad effluent (“agricultural effluent”) onto land, via a land disposal system consisting of a stone trap, sump, weeping wall and sludge bed, winter barn weeping wall, winter barn sump 1 and sump 2 and two synthetically lined effluent storage ponds to low rate pods and slurry tanker, as described in the application (APP-20222055) for resource consent dated 5 April 2021 , additional application dated 27 April 2022 , additional AEE dated 27 April 2023 and additional information responses dated 6 September 2022 and 17 September 2024 . The activity shall be limited to:</p> <p>(a) the discharge to land of agricultural effluent generated from milking of up to 640 cows up to twice per day; (b) the discharge to land of agricultural effluent via a low rate pod system and a high rate slurry tanker; (c) the discharge of agricultural effluent to an area of 272 hectares, as per the plan attached as Appendix 1; (d) the discharge of effluent from a silage storage facility no larger than XXXX m3 ; (e) the discharge to land of winter barn effluent generated from the use of two winter barns between 1 May and 30 September (inclusive).</p> <p>Advice Note: Routine monitoring inspections of this consent may occur</p>		

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	Commentary on V8
Recommended conditions from s42a report		Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v8)	Commentary on V8
		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	Advice Note: Routine monitoring inspections of this consent may occur up to two times a year. This number does not include any other required inspections.		up to two times a year. This number does not include any other required inspections.		
4	No cows shall be milked in accordance with this consent until the effluent storage capacity specified in condition 17 has been completed as per Land Use Consent AUTH-20222554.	4	No cows shall be milked in accordance with this consent until the effluent storage capacity specified in condition 17 has been completed as per Land Use Consent AUTH-20222554.		
5	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	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.		
6	The agricultural effluent discharge shall not exceed: (a) a depth of application of 25 millimetres for each individual application, and an instantaneous rate of 10 millimetres per hour via a low rate pod system on Category A land; (b) 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 on Category C land; (c) a depth of application of 5 millimetres for each individual application via slurry tanker on Category A and C land.	6	The agricultural effluent discharge shall not exceed: (a) a depth of application of 25 millimetres for each individual application, and an instantaneous rate of 10 millimetres per hour via a low rate pod system on Category A land; (b) 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 on Category C land; (c) a depth of application of 5 millimetres for each individual application via slurry tanker on Category A and C land.		
7	The minimum return period for the discharge of agricultural effluent to land shall be 28 days	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.	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	9	Nitrogen loading onto any land area as a result of the exercise of this consent		

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	Commentary on V8
Recommended conditions from s42a report		Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v8)	Commentary on V8
		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	shall not exceed 150 kilograms of nitrogen per hectare per year.		shall not exceed 150 kilograms of nitrogen per hectare per year.		
10	This consent does not authorise the discharge of: (a) effluent collected by a feed pad, stand-off pad, calving pad or underpass; and (b) agricultural effluent via high rate slurry tanker on land exceeding 7 degrees in slope (see Appendix 2).	10	This consent does not authorise the discharge of: (a) effluent collected by a feed pad, stand-off pad, calving pad or underpass; and (b) agricultural effluent via high rate slurry tanker on land exceeding 7 degrees in slope (see Appendix 2).		
11	No agricultural effluent discharge shall occur between 1 June and 31 August each year.	11	No agricultural effluent discharge shall occur between 1 June and 31 August each year.		
12	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	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		
13	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 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		
14	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: (a) form ponds or flow on the land surface, or (b) cause contamination of water		
15	The stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site (see	15	The stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site (see		

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	Commentary on V8
Recommended conditions from s42a report		Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v8)	Commentary on V8
		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	Appendix 1) that is offensive or objectionable in the opinion of the Council's Compliance Officer.		Appendix 1) that is offensive or objectionable in the opinion of the Council's Compliance Officer.		
16	Spray drift beyond the boundary of the site shall not occur	16	Spray drift beyond the boundary of the site shall not occur		
17	The agricultural effluent discharge shall occur via agricultural effluent storage facilities of between 16,136 cubic metres and 18,180 cubic metres combined capacity.	17	The agricultural effluent discharge shall occur via agricultural effluent storage facilities of between 16,136 cubic metres and 18,180 cubic metres combined capacity.		
18	The Consent Holder must maintain at least 500 mm of freeboard in the agricultural effluent storage facility at all times.	18	The Consent Holder must maintain at least 500 mm of freeboard in the agricultural effluent storage facility at all times.		
19	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 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.		
20	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	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.		
21	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	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.		
22	In the event of the failure or mismanagement of the agricultural effluent disposal system, or any other	22	In the event of the failure or mismanagement of the agricultural effluent disposal system, or any other		

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	Commentary on V8
Recommended conditions from s42a report	Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v7)	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
<p>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).</p>	<p>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).</p>	<p>Additional comments provided in TAMI evidence</p>			
<p>23 Prior to the first exercise of this consent, the Consent Holder shall prepare and submit to the Consent Authority 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</p>	<p>23 Prior to the first exercise of this consent, the Consent Holder shall prepare and submit to the Consent Authority 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</p>				

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	Commentary on V8	
Recommended conditions from s42a report		Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v7)	Commentary on V8	
		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments	
	(g) describe how the stormwater diversion on the system is set up and managed.		(g) describe how the stormwater diversion on the system is set up and managed.			
24	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	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.			
25	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 23 may be incorporated into the Farm Environmental Management Plan required by AUTH-20222055-04, and prepared in accordance with Appendix N, of the proposed Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).	25	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 23 may be incorporated into the Farm Environmental Management Plan required by AUTH-20222055-04, and prepared in accordance with Appendix N, of the proposed Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).			
	[new]	26	The consent hold shall develop a surface water monitoring programme, sampling water quality at a minimum of two sites including: (a) upstream at or about NZTM 1251517E 4873933N; (b) downstream at or about NZTM 1251517E 4873933N; These locations are shown on Figure ? in Appendix 2. Water samples shall be collected for analysis twice annually in February and August and sampled for: (i) Biochemical oxygen demand (ii) Total suspended solids (iii) Total phosphorus	Support baseline monitoring being undertaken	The consent holder shall develop a surface water monitoring programme, sampling water quality at a minimum of two sites including: (c) upstream at or about NZTM 1251517E 4873933N; (d) downstream at or about NZTM 1251517E 4873933N; These locations are shown on Figure 2 in Appendix A . Water samples shall be collected for analysis twice annually in February and August and sampled for: (i) Biochemical oxygen demand (ii) Total suspended solids (iii) Total phosphorus	Figure reference updated.

Section 42a report		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01		Proposed CGL (v8)	
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Recommended conditions from s42a report	These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments	
	(i) Dissolved reactive phosphorus (ii) Total nitrogen (iii) Ammoniacal nitrogen (iv) E.coli (v) Temperature		(vi) Dissolved reactive phosphorus (vii) Total nitrogen (viii) Ammoniacal nitrogen (ix) E.coli (x) Temperature		
26	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 Ōreti 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	27	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 Ōreti 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		

		Draft Capil Grove - Dairy Conversion - Discharge AUT2022022-01			
Section 42a report		Proposed CGL Post-consultation (v6)	TAMI comments (v7)	Proposed CGL (v8)	Commentary on V8
Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
(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.		remove or reduce any adverse effect on the environment arising as a result of the exercise of this permit.			

Section 42a report		Draft Capil Grove - Dairy Conversion – Winter Barns 20222055-03		Proposed CGL (v8)	Commentary on V8	
	Section 42a report		Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v8)	Commentary on V8
	Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
1	This consent shall not be exercised until Land Use Consent AUTH-20211143-03 has been surrendered or expires.	1	This consent shall not be exercised until Land Use Consent AUTH-20211143-03 has been surrendered or expires.			
2	This resource consent authorises the use of land for two winter barns as described in the application for resource consent dated 5 April 2022 ¹ , additional application dated 27 April 2022 ² , additional AEE dated 27 April 2022 ³ and additional information response dated 6 September 2022 ⁴ . The activity shall be limited to: (a) the use of land for two winter barns for up to 840 cows between 1 May and 30 September (inclusive); and (b) the use of the land for two winter barns during adverse weather conditions	2	This resource consent authorises the use of land for two winter barns as described in the application for resource consent dated 5 April 2022 ¹ , additional application dated 27 April 2022 ² , additional AEE dated 27 April 2022 ³ and additional information response dated 6 September 2022 ⁴ . The activity shall be limited to: (a) the use of land for two winter barns for up to 840 cows between 1 May and 30 September (inclusive); and (b) the use of the land for two winter barns during adverse weather conditions			
3	This consent shall be exercised in conjunction with Discharge Permit AUTH-20222055-01 (or any subsequent variation versions).	3	This consent shall be exercised in conjunction with Discharge Permit AUTH-20222055-01 (or any subsequent variation versions).			
4	The winter barns shall be located as described in the table below: Legal description Part Lot 2 DP 2005 Map Reference of existing winter barn (NZTM 2000) 1250221E 4872531N Property address 444 Springhills Tussock Creek Road Legal description Part Lot 2 DP 2005 Map Reference of new winter barn (NZTM 2000) 1250289E 4872287N Property address 444 Springhills Tussock Creek Road	4	The winter barns shall be located as described in the table below: Legal description Part Lot 2 DP 2005 Map Reference of existing winter barn (NZTM 2000) 1250221E 4872531N Property address 444 Springhills Tussock Creek Road Legal description Part Lot 2 DP 2005 Map Reference of new winter barn (NZTM 2000) 1250289E 4872287N Property address 444 Springhills Tussock Creek Road			
5	The winter barns shall not be located within: (a) 50 metres of any surface watercourse; (b) 100 metres of any water abstraction point; (c) 200 metres of any place of assembly or dwelling not on the subject property; (d) 20 metres of any mapped tile drains; and	5	The winter barns shall not be located within: (a) 50 metres of any surface watercourse; (b) 100 metres of any water abstraction point; (c) 200 metres of any place of assembly or dwelling not on the subject property; (d) 20 metres of any mapped tile drains; and			

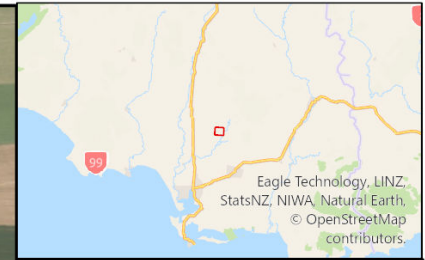
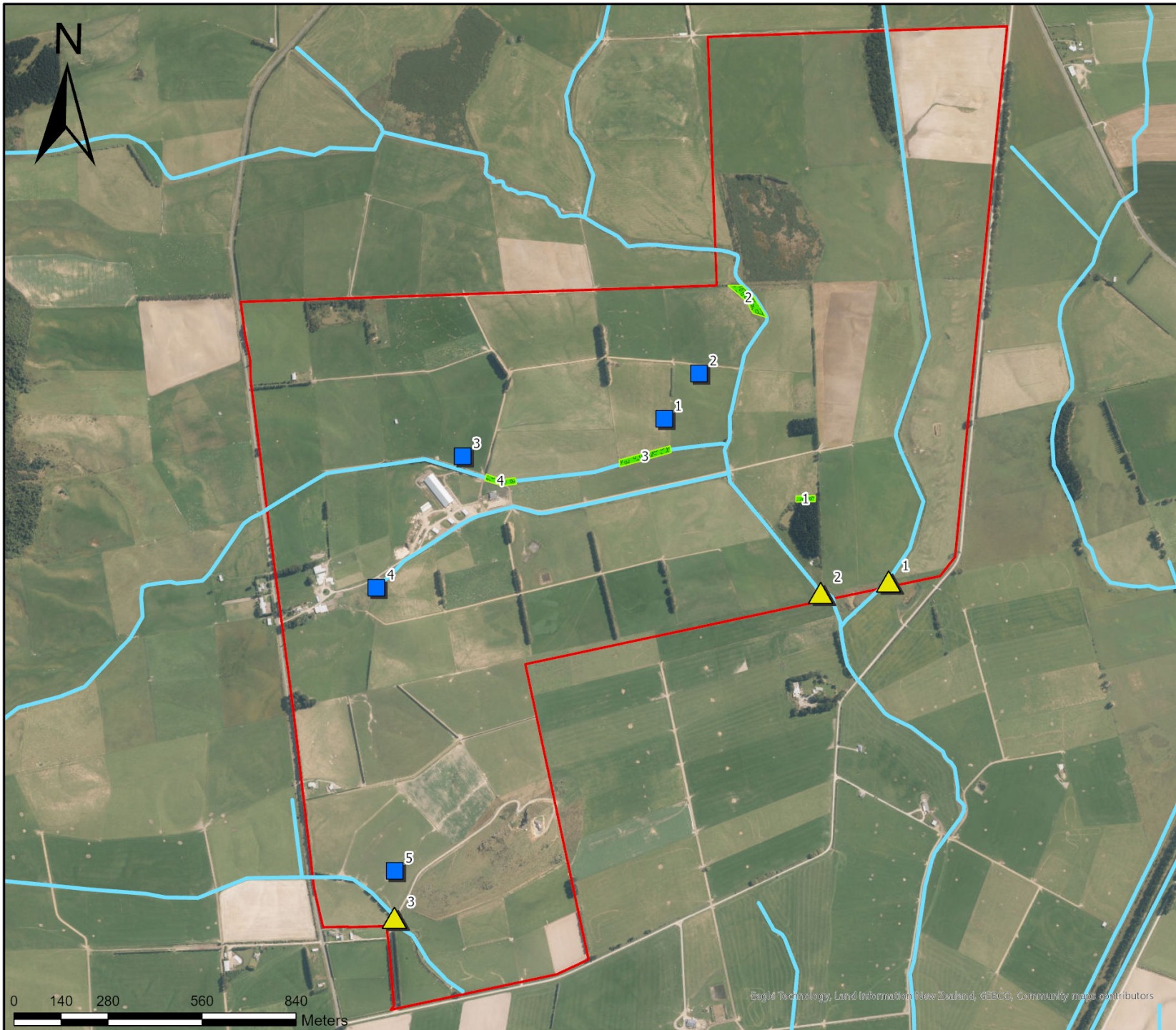
		Draft Capil Grove - Dairy Conversion – Winter Barns 20222055-03				
	Section 42a report		Proposed CGL Post-consultation (v6)	TAMI comments (V7)	Proposed CGL (v8)	Commentary on V8
	Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	(e) 20 metres from any property boundaries.		(e) 20 metres from any property boundaries.			
6	The existing winter barns shall be: (a) no greater than 4,590 m ² in area; (b) constructed with a strip drain along the northern boundary to capture effluent generated in the winter barn; (c) constructed with a sealed, impermeable base and a minimum depth of 500 mm of wood-based material or straw across the base; and (d) constructed with nibbed edges to prevent overland flow beyond the perimeter of two winter barns	6	The existing winter barns shall be: (a) Constructed with a strip drain along the northern boundary to capture effluent generated in the winter barn;; and (b) Constructed with nibbed edges to prevent overland flow beyond the perimeter of two winter barns.			
7	The new winter barns shall be: (a) no greater than 4,380 m ² in area; (b) constructed with a strip drain along the eastern boundary to capture effluent generated in the winter barn; (c) constructed with a sealed, impermeable base and a minimum depth of 500 mm of wood-based material or straw across the base; and (d) constructed with nibbed edges to prevent overland flow beyond the perimeter of two winter barns.	7	The new winter barns shall be;: (a) Constructed with a strip drain along the eastern boundary to capture effluent generated in the winter barn; (b) Constructed with nibbed edges to prevent overland flow beyond the perimeter of two winter barns.			
8	Liquid effluent generated in the winter barns shall be captured and/or scraped into the strip drain, weeping wall ancillary collection sumps which are part of the effluent system authorised by Discharge Permit AUTH-20222055-01 and Land Use Consent AUTH-20222554.	8	Liquid effluent generated in the winter barns shall be captured and/or scraped into the strip drain, weeping wall ancillary collection sumps which are part of the effluent system authorised by Discharge Permit AUTH-20222055-01 and Land Use Consent AUTH-20222554.			
9	This consent does not authorise the discharge of any liquid effluent or animal and vegetative waste produced as a result of the activity authorised by this consent being undertaken. Advice Note: The Consent Holder shall discharge: (a) the winter barn sludge and associated vegetative matter in accordance with Rule 38 of the Proposed Southland Water and Land Plan (Decisions Version) or any subsequent versions; and	9	This consent does not authorise the discharge of any liquid effluent or animal and vegetative waste produced as a result of the activity authorised by this consent being undertaken. Advice Note: The Consent Holder shall discharge: (a) the winter barn sludge and associated vegetative matter in accordance with Rule 38 of the Proposed Southland Water and Land Plan (Decisions Version) or any subsequent versions; and			

		Draft Capil Grove - Dairy Conversion – Winter Barns 20222055-03				
	Section 42a report		Proposed CGL Post-consultation (v6)	TAMI comments (v7)	Proposed CGL (v8)	Commentary on V8
	Recommended conditions from s42a report		These conditions were submitted in Evidence of H.Lowe. They are based on s42a conditions, and incorporate TAMI requests up to v6	Additional comments provided in TAMI evidence	Revised conditions proposed by Capil Grove in response to TAMI comments and refinement of mitigations	Comments from H.Lowe to explain amendments
	(b) the liquid effluent generated from the winter barns in accordance with the conditions of Discharge Permit AUTH-20222055-01 (or any subsequent variation versions).		(b) the liquid effluent generated from the winter barns in accordance with the conditions of Discharge Permit AUTH-20222055-01 (or any subsequent variation versions).			
10	The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of: (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or (c) ensuring the Oreti Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan or National Policy Statement for Freshwater Management.	10	The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of: (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or (c) ensuring the Oreti Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan or National Policy Statement for Freshwater Management.			

Draft Capil Grove - Dairy Conversion – Water Permit 20222055-02			
Number	Section 42a report	Proposed CGL post-consultation	Changes Noted
1	<p>This permit authorises the taking of groundwater at the location specified above. The rate of abstraction shall not exceed:</p> <p>(a) 2 litres per second; (b) 85,800 litres per day; and (c) 21,834,000 litres per year.</p> <p>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:</p> <p>(i) the infiltration of contaminants; and (ii) the uncontrolled discharge or leakage of water to the ground surface or between aquifers.</p> <p>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.</p>	<p>This permit authorises the taking of groundwater at the location specified above. The rate of abstraction shall not exceed:</p> <p>(a) 2 litres per second; (b) 85,800 litres per day; and (c) 21,834,000 litres per year.</p> <p>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:</p> <p>(i) the infiltration of contaminants; and (ii) the uncontrolled discharge or leakage of water to the ground surface or between aquifers.</p> <p>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.</p>	[no changes are proposed to water permit as recommended in s42a report]
2	<p>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.</p>	<p>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.</p>	
3	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(d)</p> <p>(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.</p> <p>(ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the first exercise of this consent.</p> <p>(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</p>	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(d)</p> <p>(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.</p> <p>(ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the first exercise of this consent.</p> <p>(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</p>	

Draft Capil Grove - Dairy Conversion – Water Permit 20222055-02			
Number	Section 42a report	Proposed CGL post-consultation	Changes Noted
	<p>the Consent Authority with receipts of service. These shall be supplied within five working days of the verification, and at any time upon request.</p> <p>(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.</p>	<p>the Consent Authority with receipts of service. These shall be supplied within five working days of the verification, and at any time upon request.</p> <p>(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.</p>	
4	<p>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.</p>	<p>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.</p>	
5	<p>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:</p> <p>(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;</p> <p>(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;</p> <p>(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;</p> <p>or</p> <p>(d) adjusting or altering the method of water take data recording and transmission.</p>	<p>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:</p> <p>(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;</p> <p>(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;</p> <p>(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;</p> <p>or</p> <p>(d) adjusting or altering the method of water take data recording and transmission.</p>	

Appendix A: Figures



- Property boundary
- LINZ NZ River Names
- ▲ Proposed sediment traps/wetlands
- ▨ Proposed riparian areas
- Proposed detention bunds

Capil Grove Ltd

Figure 1. Mitigation Structures



Date/Time: 27/06/2023 4:20 pm
 Scale: Not to scale
 Job number: 10740
 Map ID: 08