Recommendation and decision on notification of resource consent application(s) under sections 95-95G of the Resource Management Act 1991 (RMA)

Summary

I recommend the application is processed on a publicly notified basis. This is because:

- The application is to establish a new dairy farm;
- The adverse effects on the environment are likely to be more than minor; and
- The mitigations proposed do not adequately avoid, remedy or mitigate the adverse effects of the activity on freshwater such that they will be minor or less than minor, particularly noting the relevant policy context under which this application requires assessment.

The application

Particulars

Applicant:	Capil Grove Limited
Application reference:	APP-20222055
Site address or location:	444 Springhills Tussock Creek Road
New consent(s) for new activity(ies) (s88)	☒
New consent(s) for existing activity(ies) (s88)	☒
Change to conditions of existing consent(s) (s127)	☐

The proposal

The applicant is proposing to renew their current discharge permit and two land use consents for effluent storage and a winter barn (AUTH-20211143-02, AUTH-20211143-03 and AUTH-20211143-04) as well as a new water permit to take groundwater for a dairy operation. They also require a land use consent to establish a new dairy farm. The proposal is for:

- Discharge of silage leachate and dairy shed effluent from milking up to 640 cows all year round;
- Discharge of winter barn effluent from up to 840 cows for up to 24 hours per day from May to September (inclusive);
- The discharge of liquid effluent via low rate pods and slurry tanker onto 280ha;
- Take 85.8m^3/day of groundwater from a spring at a rate of <2L/sec;
- Land use consent for one existing winter barn and one new winter barn; and
- Land use consent for a new dairy farm conversion.

The current application initially included a land use consent for new effluent storage facilities in order to cater for the effluent generated by milking 640 cows. However, due to a review of the pond designs commissioned by Council under section 92(2) of the RMA, which identified some concerns regarding the pond design, the applicant submitted a new two pond design and requested the land use consent for new effluent storage facilities be split out into its own separate application (APP-20222554).

The applicant has proposed the dairy farm conversion be undertaken in a staged process as one winter barn and some effluent storage already exists on farm. See figure 1 below.

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

Figure 1: *Taken from the application showing the staged approach for the dairy farm conversion.*

Water permit	
Relevant rule(s)	Rule 23(d) RWP – discretionary Rule 54(a) pSWLP – permitted
Source of water (bore or watercourse)	Spring
Groundwater zone/name of watercourse	Makarewa
Aquifer type (for groundwater takes)	Lowland
Rate of take	2L/sec
Daily volume	85.8m^3/day
Consistent with 120 L/cow/day?	No
Yearly volume	21,834m^3/year
Discretionary allocation (m^3/year)	RWP Makarewa - 49,065,000 pSWLP Makarewa – 62,670,000
Amount currently allocated (m^3/year and % of discretionary allocation)	RWP Makarewa – 3,976,672 and 8% pSWLP Makarewa – 3,073,775 and 4.9%

FDE discharge permit	
Relevant rule(s)	Rule 50(f) RWP – non complying Rule 35(c) pSWLP – discretionary
Cow numbers	Stage 2: 220 cows Stage 3: 505 cows Stage 4: 640 cows

Total Farm Area	340 ha
Effective Farm Area	315 ha
Stocking rate (cows/ha)	2.0
Winter milking proposed?	Yes
Other sources of effluent?	Winter barn, silage leachate
Effluent disposal area	Consented: 148.5 ha Proposed: 280.8 ha
Application rate and depth	Low rate pods – 25mm depth, 10mm/hour rate (Cat A) 10mm depth, 10mm/hour rate (Cat C) Slurry tanker – 5mm (Cat A & C)
Storage available	Stage 2: 1,805m^3 Stage 4: 18,180m^3
Massey pond calculator 90% storage requirement	Stage 2: 1,781m^3 Stage 4: 16,136m^3

Land use consent – Winter barns	
Relevant rule(s)	Rule 35A(b) pSWLP – discretionary
Size?	Current 4,590m^2 + new 4,380m^2 = 8,970m^2
Cows?	840
Effluent collected in system?	☒ Yes ☐ No
Base material	Concrete

Land use consent – new dairy farm	
Relevant rule(s)	Rule 20(e) pSWLP – discretionary Reg 19 NES-F - discretionary
Dairy platform size?	Stage 2 = 290ha, stage 4 = 340ha
Peak milking cow number?	Stage 2: 220 cows, Stage 3: 505 cows, Stage 4: 640 cows
Cows remain on farm during winter?	All cows wintered in the barns
Intensive Winter Grazing?	None
Young stock remaining on farm?	No – all calves sold at 4 days old. No replacements are raised.

Overall, the application is a **non-complying** activity.

Public notification consideration

1. Is notification mandatory?

1.1	**Has the applicant requested that the application be publicly notified? (s95(3)(a))**	☐ Yes	Application must be publicly notified. Go to 10.2
		☒ No	Go to 1.2
1.2	**Was further information, or commissioning of a report, requested under s92?**	☒ Yes	Go to 1.3
		☐ No	Go to step 2.1
1.3	**If yes, was the request refused, or did the applicant fail to respond or fail to provide the information by the deadline?**	☐ Yes	Public notification is required by s95C. Go to 10.2

☒ No	Go to step 2.1

2. Is notification precluded?

2.1	**Is each activity subject to a rule or NES that precludes public notification?**	☐ Yes	Go to 4.1
		☒ No	Go to step 2.2
2.2	**Is each activity a controlled activity?**	☐ Yes	Application must not be publicly notified unless there are special circumstances. Go to 4.1
		☒ No	Go to 3.1

3. Is notification required?

3.1	**Are any of the activities subject to a rule or NES that requires notification?**	☐ Yes	Application must be publicly notified. Go to 10.2
		☒ No	Go to 3.2
3.2	**Will the activity have, or is it likely to have, adverse effects on the environment that are more than minor?**	☒ Yes	Application must be publicly notified. Complete 3.3 and go to 10.2
		☐ No	Complete 3.3 and go to 4.1.

3.3 Reasons adverse effects on the environment are less than minor / minor / more than minor

The existing environment

The existing site is made up of two blocks; 444 Farm and Tuffin block. 444 Farm is 177ha in size and has been previously operated as a sheep milking operation (associated discharge permit AUTH-205665 expired 1 January 2019). The Tuffin block is 112ha in size and has been used to farm dairy support and beef cattle and intensive winter graze on swedes. The applicant recently purchased three neighbouring properties known as the Harwood block (15ha), Hancox block (37ha) and Sharks Tooth block (9ha). The Harwood block has been historically used as a sheep farm whereas the Hancox block has been historically used for dairy support and beef cattle and intensive winter grazing on kale. Sharks Tooth block (9ha) was historically farmed as part of Tuffin block. 50ha of 444 Farm is being leased back to the original owner.

The proposed 3401ha farm is located approximately 13km south east of Winton Township. The applicant currently holds discharge permit AUTH-20211143-02 and land use consents AUTH-20211143-01, AUTH-20211143-03 and AUTH-20211143-04. The discharge permit authorises the discharge of winter barn effluent via low rate pods and slurry tanker. The land use consents authorise the use of land for dairy support, to use land for a winter barn, and to construct, maintain and use a new effluent storage facility. The property is located within the Makarewa River catchment which is part of the wider Oreti FMU.

I note a site visit has not been undertaken at the time of writing this report, however one is scheduled for the 26th October. I do not consider that a site visit prior to writing this report would have changed my recommendation as the already existing structures on site are not likely to have more than minor adverse effects.

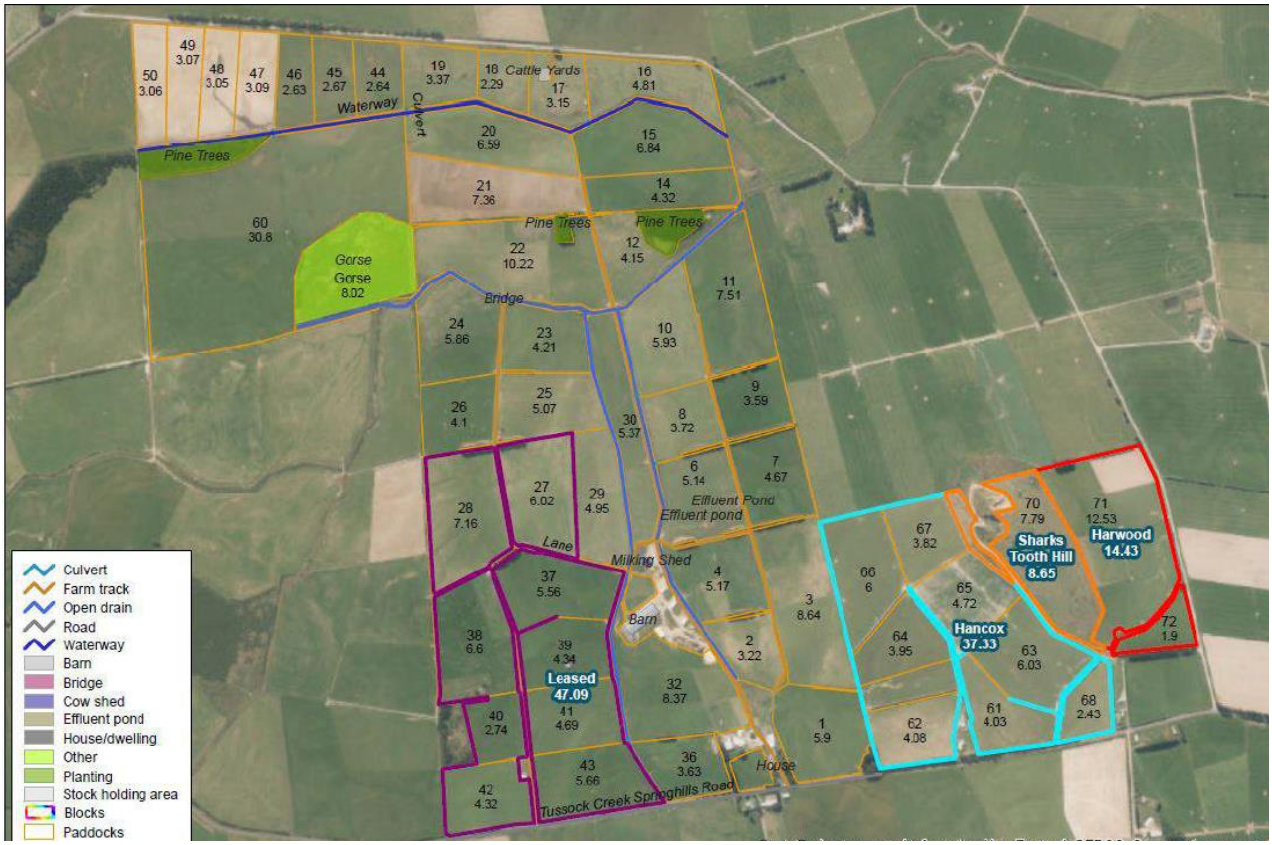

Figure 2: *Taken from the application showing the locations of the Capil Grove 444 Farm in relation to the Hancox Block, Harwood Block and Sharks Tooth Block.*

Soils and Physiographic Zones

Soils	**Soil Type**	**Vulnerability Factors**		
		Structural Compaction	**Nutrient Leaching**	**Waterlogging**
	Makarewa	Moderate	Slight	Severe
	Pukemutu	Severe	Slight	Severe
	Kauana	Slight	Very severe	Nil
	Te Mara	Moderate	Moderate	Moderate
FDE land classification	Category A – Artificial drainage Category C – Sloping land			
Physiographic Zones	Gleyed – no variant (201ha) Gleyed – overland flow (17ha) Bedrock Hill Country – overland flow (42ha) Bedrock Hill Country – artificial drainage (12ha) Peat Wetlands (68ha)			

Soils in the Gleyed physiographic zone are poorly drained and prone to water logging. The soils may accumulate and store nitrogen during summer and early autumn months when soil moisture levels are low. This accumulated nitrogen starts moving with water when soils become wet in late autumn and winter and may be lost via artificial drains and overland flow to surface waterways. Some nitrogen will be removed from the soil and aquifers via denitrification, resulting in relatively low groundwater nitrate concentrations.

In the Bedrock/Hill Country Physiographic zone, the main risk is to surface water quality from contaminant movement via overland flow, and artificial drainage where relevant. Due to the topography water and contaminants quickly flow downslope during heavy or prolonged rainfall.

Soils in the Peat Wetlands physiographic zone are extremely acidic and prone to water logging. Often there is a seasonal water table that sits close to the ground surface resulting in seasonal ponding and overland flow to nearby streams. Soils and aquifers in this zone are mainly made up of organic material, making them very good at removing nitrogen (via denitrification). Therefore, nitrogen build-up is not an issue for aquifers in this zone. However, a lack of silt and clay and the highly acidic property of peat soils mean that phosphorus is poorly retained and easily leached to water.

Groundwater quality
There are no groundwater monitoring bores on the property, however E46/0913 (12m deep) located directly south of the property showed <0.01mg/L when it was tested once in January 2013 and E46/0743 (8.8m deep) which showed 0.05mg/L when it was tested once in March 2077. The next closest monitoring bores located 2-2.5km south are E46/0330 (6m deep), which was tested once in November 1997 and showed a groundwater nitrate level of 2.3mg/L and E46/0689 (9m deep) which was tested once in October 2007 and showed a groundwater nitrate level of 1.96mg/L.

Surface water quality
Surface water quality in the downstream receiving environment is degraded, in particular the Makarewa River at Wallacetown sits in the worst 25% of all sites for E.coli, Total Nitrogen, Total Oxidised Nitrogen, Dissolved Inorganic Nitrogen, Ammoniacal Nitrogen, Nitrate Nitrogen and Total Phosphorus. It also sits in the worst 50% of all sites for Dissolves Reactive Phosphorus[1].

Adverse effects of the proposed activities on the environment

Consideration of the following effects is required:
- effects on water quality;
- effects on water quantity;
- soil health; and
- odour.

Water Quality

Discharge
Potential adverse effects of discharging effluent onto land include contamination of groundwater and contamination of surface waterways. The applicant has proposed good management practices that will be adopted to minimise adverse effects arising from the activity:

- Storage of effluent in the pond(s) when conditions are not suitable for discharge;
- Adhering to buffer distances from surface waterways and bores;
- Application of effluent at low rates and depths; and
- Use of a slurry tanker as required.

The discharge of dairy farm effluent to land within Category C using high rate irrigation is a non-complying activity under Rule 50(f) of the RWP. The applicant was asked to confirm that they propose to discharge effluent to land via a slurry tanker at 5mm depth on category C land as the application assessed the discharge activity as a discretionary activity against Rule 50(d) of the RWP. The applicant's response was "*Slurry tankers are not high rate discharges*". Low rate irrigation is defined in the RWP as "*Where farm dairy*

[1] https://www.lawa.org.nz/explore-data/southland-region/river-quality/oreti-river/makarewa-river-at-wallacetown/

effluent is applied at a maximum instantaneous application rate less than or equal to 10 mm per hour." The applicant was then asked to provide evidence that the proposed slurry tanker could meet this definition. The applicant's response included the following calculation: "*The* [slurry tanker] *attachment has an 8 m spread which applies 35,000 L per application. Travelling at a typical rate of 5 km/hour and covering a distance of 1,250 meters results in 1 ha of area covered. Therefore, applying 35,000 L over an area of 10,000 m2/hour equates to an application rate of 3.5 L/m2/ hour (3.5 mm/ hour).*" However, a distance of 1,250 m would be reached within 15 minutes at 5km/hour, therefore the above calculation actually equates to a discharge rate of 3.5mm/15 minutes or 14mm/hour and as a result the proposed slurry tanker is considered a high rate irrigation method.

Southland has an extensive network of subsurface drainage, which can transport contaminants directly from the soil into surface water and adversely affect the quality and health of streams, rivers, and wetlands. Surface water quality is therefore also a reflection of land management practices above installed subsurface drainage systems. The application states "*As this is a recently purchased property, the exact location of the tile drainage system is unknown and is therefore assumed to be* [present] *in all paddocks except in the steeper Tuffin Block and Shark's Tooth Hill area … In normal conditions effluent can safely applied over tile drains and swales as effluent application depths are low enough to ensure effluent is retained in the plant root zone of the soil. Where the operator suspects there may be a risk of effluent entering a tile drain a visual inspection will be made of the tile exit point and immediate action taken to block the tile if any effluent discharge is occurring*." Good management of the effluent discharge will be required to reduce the likelihood of any contaminants reaching the subsurface drains.

Land Use – Establish new dairy farm

The applicant has provided nutrient budgets of the current scenario and multiple stages of the proposal as required by Part B section 4 of Appendix N in the proposed Southland Water and Land plan. These budgets have been created by Victoria Jones, who is a Certified Nutrient Management Advisor, using the Overseer Software. Council commissioned Nicky Watt, who is a Certified Nutrient Management Advisor, to review the nutrient budgets for a 'sensibility check'. She concluded the proposed budgets had a medium level of robustness and requested further explanations and adjustments to the budgets. Ms Jones made some adjustments to the budgets which did not satisfy Ms Watt's concerns and as a result Ms Jones confirmed on 8 July 2022 "*we don't intend to refine the model any further*". Thus, Ms Watt cannot confirm that the Overseer Best Practice Data Input Standards have been followed.

	Current land use	**Stage 3- Proposed dairy platform (505 cows)**	**Stage 4 – Proposed dairy platform (640 cows)**	**Overall difference (%)**
N Loss to water (kg/ha/yr)	34	29	28	-17.6%
N Loss to water (kg/yr)	11,667	9,887	9,515	-18.4%
P Loss to water (kg/ha/yr)	1.9	1.9	1.9	0%
P Loss to water (kg/yr)	630	647	656	+4.1%

Table 1: *Predicted losses modelled in OverseerFM version 6.4.3.*

The table below outlines the good management practices (GMPs) and mitigation measures which have either occurred or are proposed to be undertaken on farm. Each GMP/mitigation has a varying degree of effectiveness in terms of nitrogen, phosphorus, microbes (e.g. E. coli) and sediment loss. Mitigation measures and GMPs for the landholding should be selected based on specific characteristics of the physiographic zones and key contaminant pathways present.

Mitigation/GMP	Implementation timeframe	Mitigation measure or GMP?
Fence off all waterways	Done	Good management practice
Plant all riparian margins	Small areas of existing shelter belts but no new planting proposed	Good management practice
Milk cull cows and reduce the need for replacement heifers	All calves are sold at 4 days old	**Mitigation Measure**
Provide sufficient effluent storage to enable deferred application	Yes once storage is constructed	Good management practice
Defer effluent application when soil conditions are unsuitable	From first exercise of new consent	Good management practice
Use of winter barns to take cows off pasture during adverse weather	Currently occurs	**Mitigation Measure**
Apply effluent at low rates	Low rate pods proposed	Good management practice
Avoiding intensive winter grazing	45 ha of barley proposed for spring	**Mitigation Measure**
Synthetic fertiliser use capped at 190kg/ha/yr	From first exercise of new consent	Good management practice
Avoid applying fertiliser to excessively dry or saturated	From first exercise of new consent	Good management practice

Table 2: *GMPs and mitigation measures to occur as part of the dairy farm conversion*

The table above shows which measures are identified as mitigations and which are GMPs. Overseer assumes that GMPs are being used, which means some of the GMPs are already accounted for in Overseer. Others are not accounted for in Overseer and are therefore not taken into account by the budget, however, all mitigations listed above have been taken into account by the budgets as they parameters that can be entered into OverseerFM.

In light of the Government's Science Advisory Panel's review of the effectiveness of Overseer in assessing and predicting farm-scale nitrogen losses, and the conclusion that the current Overseer model is not fully fit for purpose in the way it is being currently used in the consenting process, mitigation measures are of the utmost importance when assessing this application. This is because they represent additional steps that can be taken to offset or compensate for the effects of the change or intensification of land use. Those crucial mitigations are:

- Buying in cull cows as replacements instead of rearing calves;
- Housing cows in winter barns; and
- Removing intensive winter grazing from the system.

Nitrogen

The budgets show that the N losses on the landholding are expected to decrease by 2,152kg/year or -17.6% when the current land use of all blocks is compared to the proposed dairy farm milking 640 cows. Due to the nature of the landholding's soils the risk of nitrogen leaching through the soil to groundwater is low. However, there is a risk of nitrogen being transported to surface water via overland flow and artificial drainage as it can build up during summer in the soil and become mobilised in late autumn and winter when soil moisture levels rise.

The main reasons for the reduction in predicted nitrogen loss between the current and proposed scenarios are the removal of intensive winter grazing and the inclusion of winter barns. Wintering cows in paddocks

can cause compaction of soil which reduces soil porosity and hydraulic conductivity and increases bulk density, particularly on fine textured soils which have become water-saturated (Luo & Ledgard, 2021)[2]. Fallow soil can run off into surface waterbodies carrying with it phosphorus and microbial contaminants. The current land use budget includes 35 ha of swedes and 16 ha of kale with no wintering structure, compared to the stage 3 budget which has modelled 8 ha of kale and a wintering structure for 705 cows, whereas the stage 4 budget has modelled no winter crop and a wintering structure for 840 cows. The table below shows the wintering system comparisons of all stages of the conversion that have been modelled in OverseerFM.

	Current land use	**Stage 3- Proposed dairy platform**	**Stage 4 – Proposed dairy platform**
Fodder beet	35 ha	0 ha	0 ha
Kale	16 ha	8 ha	0 ha
Cows in winter barn	N/A	705	840

Table 3: *Wintering system for different stages of the dairy farm conversion*

The barley grain has been modelled in the stage 4 proposed scenario as being imported onto the farm, which would normally over estimate N and P losses as those contaminants are imported onto the farm along with the grain. The application states "*there is no option to have the barley grain taken from storage so it has been modelled as purchased. This will overestimate the amount of nitrogen lost to the system as it is accounting for nitrogen being brought on to the property via the modelled imported grain*". Ms Watt was asked if she agreed with this statement. In her opinion "*The barley grown on the property would be harvested and the model assumes is exported (N exported as grain as the model does not allow for it to be stored on farm) and assuming that the same amount of grain that was harvested is now purchased in then there would be no change to the N loss*." As a result, I do not consider that modelling the barley as imported would result in OverseerFM overestimating the overall N loss from the stage 4 proposed scenario.

Phosphorus

The budgets show that the P losses on the landholding are expected to increase by 26kg/year or +4.1% when the current land use of all blocks is compared to the proposed dairy farm milking 640 cows. The increase in P loss may be a result of the Overseer assumption that 30% of the P on laneways is lost to water, which means all new dairy lanes would automatically result in an increase of P losses. A study done by Lucci, McDowell and Condron (2012)[3] showed soil measured in a laneway was enriched in Olsen P (56 mg P/kg) compared to pasture (24 mg P/kg), as well as having a greater bulk density resulting from more frequent use by stock. They also concluded that the laneway contributed to 89% of the Dissolved Reactive Phosphorus load when surface overland flow was likely, which represents a substantial source of P loss on dairy farms. However, the application does not detail where the new lanes will be located or their proximity to the surface waterways present on farm so I cannot be certain if this assumption within Overseer is overestimating P loss from 'other sources'.

The application states "*The barley* [crop] *will utilise extra phosphorus reserves from the soil that could otherwise runoff from the system in early autumn*." The rooting depth of barley is significantly deeper than pasture so it can capture and attenuate nutrients that are lower in the root zone and any crop which needs P will absorb extra P if it is available. However, barley is not a high use P crop when compared to brassica fodder crops and so I cannot be certain if the crop will absorb excess P.

Microbes (e.g. E. coli) and sediment loss

[2] Luo, J. and Ledgard, S. (2021) New Zealand Dairy Farm Systems and Key Environmental Effects. *Frontiers of Agricultural Science and Engineering*, Vol 8, issue 1, pages 148–158.

[3] Lucci, G. M., McDowell, R. W. and Condron, L. M. (2012) Phosphorus source areas in a dairy catchment in Otago, New Zealand. *Soil Research*, Vol 50, issue 2, pages 145-156.

Sediment and microbiological contaminants are not modelled within Overseer. However, phosphorus loss modelling can be used to indicate the probability of sediment and microbiological contaminant losses. This is because phosphorus in the soil readily bonds to fine soil particles and is therefore lost to the environment via the same contaminant pathways e.g. overland flow and erosion. Microbiological contaminants are also lost to the environment by the mechanics of water flow via these same pathways. In spite of this, P loss processes are not exactly the same as microbial and sediment losses, and therefore the assessment only provides a very broad assumption of the likely losses and risks to the environment from sediment and faecal indicator bacteria. That assumption being if P losses are predicted to increase then there is likely to be a roughly similar level of rise in sediment and microbe losses to freshwater.

Water Quantity

The applicant is proposing a daily abstract volume of 85.8m^3/day and yearly volume of 21,834m^3/year from a spring. The daily abstraction volume equates to 120L/cow/day (640 milking cows) plus 45L/cow/day for the 200 extra cows housed in the winter barns during winter. The yearly abstraction volume equates to less than 94L/cow/day x365 days. This is considered industry standard of efficient use for shed and stock drinking water use. The groundwater zone from which the water would be taken (Makarewa in both the RWP and pSWLP) is not over-allocated however the spring take is considered to have either riparian or direct hydraulic connection to the adjacent surface waterbody and the applicant has not undertaken a stream depletion assessment as per Appendix L.2 of the pSWLP. This is because the applicant considers "*There are no surface water bodies within 5 m that are classified as requiring stream depletion effects to be assessed. As mentioned in Appendix L.2, "water bodies characterised as ephemeral will be excluded from consideration of stream depletion effects". The surface body is an ephemeral and the only time where this would flow is during a heavy rainfall/ flood event*". Additionally, the applicant has confirmed on the Water permit application form that the take is from a spring and not from a bore but has not described the nature of the intake structure. Based on the information available and the uncertainties regarding effects on water quantity, such as stream depletion effects, primary allocation allowance of the adjacent surface waterbody and any associated low flow cut off to protect the habitat for critical value species, as per Appendix K of the pSWLP, I consider that there is risk of more than minor adverse effects.

It should be noted that the water abstraction is a permitted activity under the proposed Southland Water and Land Plan, however Section 95D(b) of the RMA states Council "*may disregard an adverse effect of the activity if a rule or national environmental standard permits an activity with that effect*". Council is declining its discretion to apply the permitted baseline due to the uncertainty about the effects of the water abstraction, and the fact the abstraction is a new activity with no section 124 rights and Policy 39 (pSWLP) specifically encourages all adverse effects of an application to use land for a farming activity, permitted or otherwise, be considered.

Soil Health

The liquid effluent disposal field is proposed to increase from the currently consented 148.5ha to 280.8ha to include all new blocks of land recently purchased except Sharks Tooth block. The proposed discharge area is more than the area needed to meet the minimum requirement of 4 hectares per 100 cows, which is calculated to achieve a maximum loading of 150 kg of nitrogen/hectare/year from effluent irrigation and more than the 8 hectares per 100 cows as recommended in the Best Practice Guidelines Booklet[4].

Odour

Effluent storage and wintering facilities can cause problems with odour, however, the closest dwelling on another property is located approximately 800m from the current effluent storage ponds and 500m from the current and proposed wintering barns. Additionally, all facilities are more than 200m from the property boundary. As long as the effluent is applied in accordance with the specified application rates and depths, and the buffers specified by recommended consent conditions are maintained, then there should be little

[4] Farm Dairy Effluent, Best Practice Guidelines (2007), Environment Southland

risk of adverse effects from odour and spray drift on surrounding land owners and occupiers. Additionally, a recommended condition of consent, if consent was to be granted, requires that the stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site that is offensive or objectionable.

Adverse effects that have been disregarded

Policy 39 of the proposed Southland Water and Land Plan states:

"*When considering any application for resource consent for the use of land for a farming activity, the Southland Regional Council should consider all adverse effects of the proposed activity on water quality, whether or not this Plan permits an activity with that effect*".

As such, **all effects** related to the use of land for farming and the associated activities undertaken as part of the entire farming operation have been considered, and **no effects have been disregarded**.

Planning provisions (policies and objectives) relevant to adverse effects

A policy assessment has been included in the consent application. I have reviewed this assessment and also examined the relevant planning documents. The following are the most relevant provisions:

- National Policy Statement for Freshwater Management 2020 (NPS-FM)
  - Objective 1 seeks to ensure that natural and physical resources are managed in a way that prioritises first, the health and well-being of water bodies and freshwater ecosystems, second, the health needs of people, third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.
  - Policy 1 seeks to manage freshwater in a way that gives effect to Te Mana o te Wai.
  - Policy 2 seeks to actively involve Tangata Whenua in freshwater management and Māori freshwater values are identified and provided for.
  - Policy 3 seeks to manage freshwater in an integrated way that considers the effects of the use and development of land, including the effects on receiving environments.
  - Policy 9 seeks to protect the habitats of indigenous freshwater species.
  - Policy 11 seeks to ensure freshwater is allocated and used efficiently, all existing over-allocation is phased out and future over-allocation avoided.
  - Policy 12 seeks to achieve the national target for water quality improvement.
  - Policy 15 seeks to enable communities to provide for their social, economic, and cultural well-being in a way that is consistent with the NPS.

- Proposed Water and Land Plan 2018 (pSWLP)
  - Objective 1 - Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast
  - Objective 2 - The mauri of water provides for te hauora o te taiao (health and mauri of the environment), te hauora o te wai (health and mauri of the waterbody) and te hauora o te tangata (health and mauri of the people).
  - Objective 3 - Water and land are recognised as enablers of the economic, social and cultural wellbeing of the region.
  - Objective 4 - Tangata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems
  - Objective 6 - Water quality in each freshwater body, coastal lagoon and estuary will be maintained where the water quality is not degraded and improved where the water quality is degraded by human activities.

- Objective 8 - The quality of groundwater that meets both the Drinking Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface water bodies, established under Freshwater Management Unit processes is maintained.
- Objective 11 - The amount of water abstracted is shown to be reasonable for its intended use and water is allocated and used efficiently.
- Objective 12 - Groundwater quantity is sustainably managed, including safeguarding the life-supporting capacity, ecosystem processes and indigenous species of surface water bodies where their flow is, at least in part, derived from groundwater.
- Objective 13 - Provided that the quantity, quality and structure of soil resources are not irreversibly degraded through land use activities or discharges to land; and the health of people and communities is safeguarded from the adverse effects of discharges of contaminants to land and water; and ecosystems (including indigenous biological diversity and integrity of habitats), are safeguarded, then land and soils may be used and developed to enable the economic, social and cultural wellbeing of the region.
- Objective 18 - All persons implement environmental practices that optimise efficient resource use, safeguard the life supporting capacity of the region's land and soils, and maintain or improve the quality and quantity of the region's water resources.
- Policy 6 seeks to avoid, remedy, or mitigate adverse effects on water quality from contaminants in the Gleyed, Bedrock/Hill Country and Lignite/Marine Terraces Physiographic zones by requiring implementation of GMPs to manage contaminants transported via artificial drainage, and overland flow where relevant and having particular regard to adverse effects from these contaminant pathways when assessing resource consent applications and Farm Environmental Management Plans;
- Policy 11 seeks to avoid, remedy, or mitigate adverse effects on water quality from contaminants in the Peat Wetlands Physiographic zone by requiring implementation of GMPs to manage contaminants transported via artificial drainage, deep drainage, and lateral drainage and having particular regard to adverse effects from these contaminant pathways when assessing resource consent applications and Farm Environmental Management Plans and decision makers generally not granting consents for additional dairy farming of cows where contaminant losses will increase as a result of the proposed activity.
- Policy 13 seeks to manage land use activities to enable the achievement of Policies 15A, B and C;
- Policy 15A-C seek to main water quality where standards are met and improve water quality where standards are not met;
- Policy 16 seeks to minimise the adverse environmental effects, including cumulatively, on groundwater and surface water quality from farming activities and require all farming activities to implement a Farm Environmental Management Plan.

➢ Te Tangi a Tauira (2008)
- Policy 3.5.1.3 seeks to ensure all discharges of dairy farm effluent to land must have a resource consent.
- Policy 3.5.1.8 requires best practice for land application to manage farm effluent in order to minimise adverse effects on the environment.
- Policy 3.5.1.11 seeks to avoid any surface run off/overland flow, ponding or contamination of water resulting from the application of dairy shed effluent to pasture.
- Policy 3.5.1.14 requires a buffer of at least 100m be established between discharge activities and bores.
- Policy 3.5.1.15 seeks that all spray drift be managed and contained within the boundaries of the consent area.
- Policy 3.5.10.3 seeks to protect and enhance the mauri, or life supporting capacity, of freshwater resources throughout Murihiku.

- Policy 3.10.5.5 seeks to promote the management of freshwater according to the principle of ki uta ki tai, and thus the flow of water from source to sea.
- Policy 3.5.11.14 seeks to use riparian enhancement, buffer zones, fencing, and related streamside management tools as conditions of consent to ensure that human use of rivers and their water does not compromise river health.
- Policy 3.5.13.1 seeks to ensure the role of Ngāi Tahu ki Murihiku as tangata whenua and kaitiaki of water must be recognised and provided for in all water quality management.
- Policy 3.5.13.7 ensures when assessing the effects of an activity on water quality, where the water source is in a degraded state, the effects should be measured against the condition that the water source should be, and not the existing condition of the water source.
- Policy 3.5.13.8 promote the restoration of wetlands and riparian areas as part of maintaining and improving water quality, due to the natural pollution abatement functions of such ecosystems.
- Policy 3.5.14.4 prefers, in the Southland Plains region, water takes are from bores, as opposed to surface water abstractions.
- Policy 3.5.19.3 seeks to promote riparian zone establishment and management as a tool to improve water quality in the waterways of Murihiku.

There is clear policy direction in the pSWLP that water quality should be maintained or improved where water quality is degraded by human activities and as mentioned above the surface water quality in the receiving environment is degraded.

The applicant has offered mitigations in an attempt to mitigate the adverse effects. While the applicant has proposed to buy cull cows as replacements, instead of rearing replacement calves, which removes the need for R1s and R2s within the farming system, the RSUs on the landholding overall are still increasing from 6,580 for the current land use to 8,131 for the stage 4 converted dairy farm.

The NPS-FM has a hierarchy of obligations in Te Mana o te Wai that prioritises:

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

Giving effect to Te Mana o te Wai means the first priority is to protect the life supporting capacity and wellbeing of water. The applicant's proposed mitigations will not avoid, remedy or mitigate the potential or actual adverse effects on freshwater to the extent that they are minor or no more than minor and as a result I consider that the proposal is inconsistent with the hierarchy of obligations above. Notably, the application is lacking mitigations that prioritise and protect the health and well-being of the surface water bodies, such as planting riparian buffers with native species, retiring high risk land, incorporating plantain into their re-grassing programme, creating wetlands and installing sediment traps at surface water outfalls that the overland contaminant pathways flow to and the assumed tile drainage network drains to.

Conclusion: significance of adverse effects on the environment

The above objectives and policies have been used to inform and determine the level of adverse effects associated with the proposed activity, as the direction of the policies help establish what effects are acceptable and therefore whether the adverse effects of the proposed activities are less than minor, minor or more than minor.

The applicant has demonstrated that there will be sufficient storage available in the effluent storage ponds for stages 3 and 4 of the conversion when the land is not suitable to discharge effluent to. However, the storage calculator provided for stage 2 of the conversion only has 220 cows being milked during the months of September to December. The applicants justification for this is "*It is expected that the new pond will be*

installed before the following year which is why January - April haven't been accounted for." As a result, I cannot be certain the current ponds are adequately sized to cater for milking 220 cows for an entire season, which is generally August – May if winter milking is not undertaken. The existing ponds both passed a pond drop test in February 2021. The existing effluent system also consists of a sludge bed and winter barn collection channel. The sludge bed was visually inspected in June 2021 to ensure it had no holes, cracks or defects that would allow effluent to leak from it. The winter barn collection channel was visually inspected in May 2021 which revealed some contraction cracks in the concrete channel. A condition was included in Land use consent AUTH-20211143-04 to repair the cracks within 3 months of the first exercise of the consent. The applicant confirmed the repairs have been completed. The new effluent storage ponds are being processed as a separate application (APP-20222554) however at the time of writing this report the Engineer's designs indicated the ponds would be synthetically lined with 1.5 HDPE and include leak detection systems.

Effluent can be discharged at low rates via pods, which is consistent with the key policies in avoiding and mitigating effects on water quality. However, I cannot be certain of the effects on water quality that may arise from the discharge of effluent via a high rate slurry tanker on high risk Category C land. The application has not adequately assessed the effects or detailed how of the farm is in fact under 7 degrees slope and therefore I do not have enough information to determine the effects and as a result I consider that there is risk of more than minor adverse effects.

The water abstraction volume is considered efficient and reasonable for its end use which is consistent with key water quantity policies. However, I cannot be certain of the effects on water quantity that may arise from the abstraction from the spring. The application has not adequately assessed the effects of stream depletion and primary allocation and therefore I do not have enough information to determine the effects and as a result I consider that there is risk of more than minor adverse effects.

The two winter barns allow the applicant to stand cows off pasture during adverse weather, the current barn has a concrete base and effluent generated in the barn is scraped to a collection channel where solids and liquids are separated. The solids are then discharged as a permitted activity and the liquid effluent is collected in the effluent system, which ensures it can be managed and will not flow beyond the perimeter of the barn. The new barn is proposed to be operated in the same way.

Dairy lanes and farm tracks can be a significant localised source of run-off, especially where there is a concentration of effluent deposited on the lane or track and/or it is close to a waterway with no buffer in place. However, the conversion plan does not include a plan for dairy lane placement, design or maintenance in order to mitigate the potential adverse effects of effluent and storm water run-off to surface waterways.

The increase in RSUs between the current land use and the proposed dairy farm operation will result in localised losses increasing as a result of the intensification of land. There will be an increase in losses from all blocks to the Makarewa River, which will, especially considered cumulatively, result in addition nutrients and contaminants entering the localised receiving environment. Increased losses result in increased contaminant loadings in waterways which can cause a number of issues, including nuisance algal growth, over sedimentation and eutrophication. The localised effects of the change of land use have not been adequately assessed for the proposal and therefore I do not have enough information to determine that the effects of the proposal on the localised receiving environment will be less than minor.

It is acknowledged that the accuracy of Overseer outputs has been questioned due to the Government's review of the model; however, it still provides a useful indication of the relativity between different farm practices. The modelled phosphorus losses are predicted to increase and the fact that concerns raised by Council's Overseer expert have not been addressed further reduces the reliance that can be placed on the use of Overseer outputs to satisfy the conditions of Regulation 24 of the NES-F.

Lastly, no consultation has been undertaken with iwi who hold mana whenua of the area. This is inconsistent with Policy 2 of the NPS-FM and multiple policies within the Te Tangi a Tauira plan. In the absence of detail in the application and AEE of the potential cultural effects of the proposal I am unable to conclude on the scale of potential effects on cultural values. However, in light of my conclusions above, I consider that there is risk of more than minor adverse effects on cultural values.

I consider the proposal is likely to have adverse effects on the environment that are more than minor.

Recommendation and decision

10. Officer's recommendation

10.1	**The application be processed non-notified**	☐
10.2	**Public notification is recommended**	☒
10.3	**The application be placed on hold while the applicant tries to obtain written approvals from the affected persons**	☐
10.4	**Limited notification is required. Persons to be served notice are those listed in 8.2**	☐

Jade McRae
Senior Consents Officer

Date: 13 October 2022

Decision under Delegated Authority

11.1	**I agree with the recommendation**	☒
11.2	**The application will be processed non-notified**	☐
11.3	**The application will be publicly notified**	☒
11.4	**The application shall be placed on hold while the applicant tries to obtain written approvals from the affected persons**	☐
11.5	**The application will be limited notified. The parties to be served notice are those listed in section 8.2**	☐

This decision is made under delegated authority by:

Bruce Halligan
Consents Manager

Date: 14/10/2022