

21 August 2019

Environment Southland
Private Bag 90116
Invercargill 9348

Our ref: 18247
ES ref: APP-20191128

Attn: Alex Erceg

Dear Alex

RE: Request for Further Information under Section 92(1) of the Resource Management Act 1991 – APP 20191128, application for a suite of consents relating to a dairy farming activity.

We have received your request for further information dated 8 August 2019.

We agree to provide the following information in response to the specific requests.

1. A description of any Registered Drinking Water supplies in the receiving environment.

We interpret your reference to the receiving environment to be a broad interpretation of the likely surface water and groundwater receiving environments. So for example we have not included registered drinking water supplies over 20 kilometres in a general downgradient direction. We understand that there is good evidence to indicate that the general direction of groundwater flow is southerly¹.

According to ES's Beacon GIS (which we have crossed - checked with the original sources), there are three 'registered drinking water suppliers'² within a broad definition of the receiving environment of South Dairy.

Lochiel School (LOC001, Figure 1) bore is located 250m south west of the dairy platform. This site is located within the Oreti River catchment and the Lower Oreti groundwater zone. This

¹ Land Water People (2017) Groundwater provisions of the Proposed Southland Water and Land Plan, 88p.

² As specified in Section 69J of the Health Act 1956



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drinking water site supplies 25-100 people. According to NZ Register of Drinking Water Suppliers this water is sourced from a bore. It is likely that this is supplied from bore E46/1473, unknown depth, unknown diameter, and unknown date of establishment.

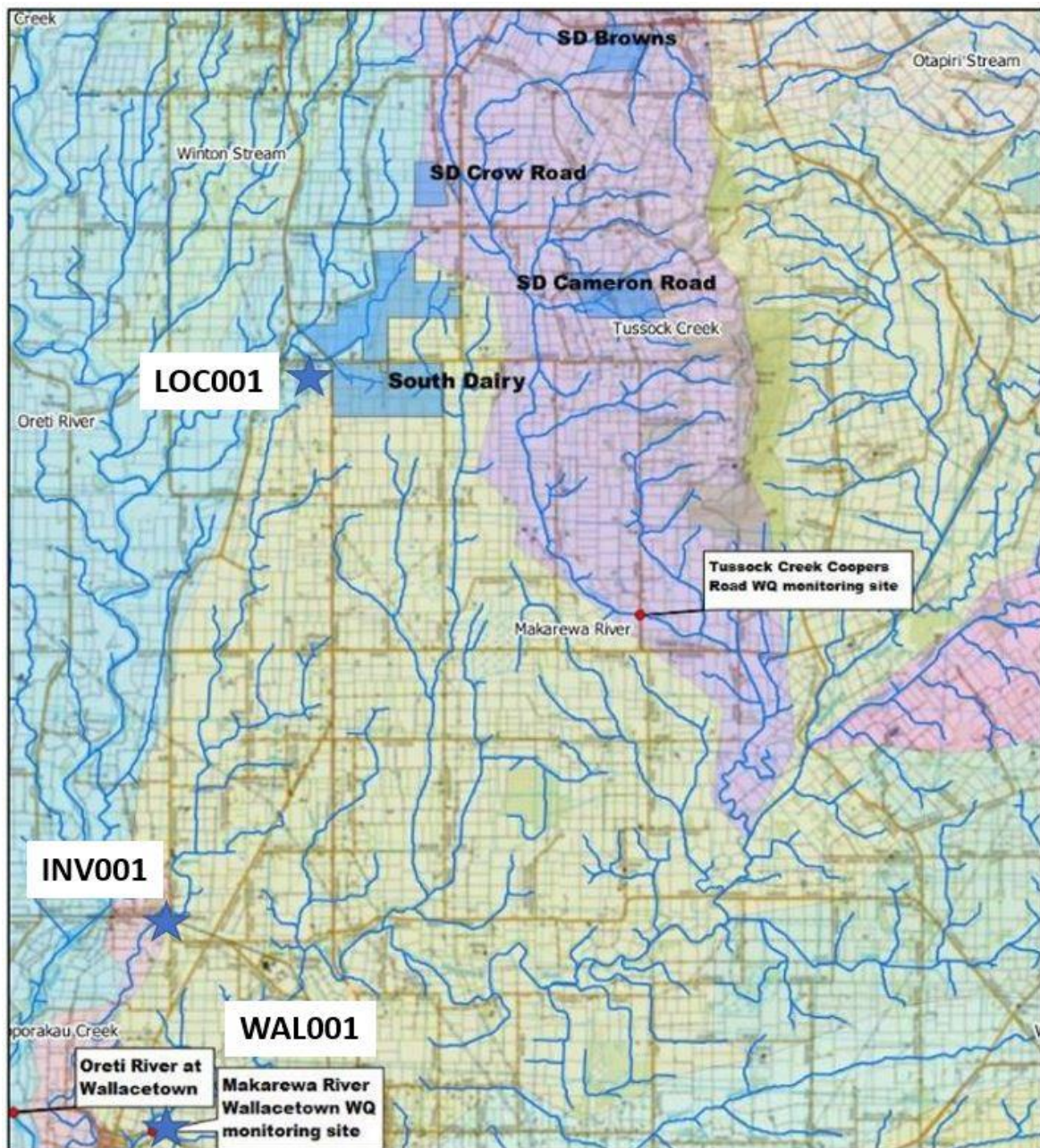


Figure 1 Location of registered drinking water suppliers relative to the South Dairy properties.

Invercargill's main water supply (INV001) is located approximately 11km south west of the dairy platform. The creeks and tributaries from the western side of the dairy platform flow into the Oreti River, where Invercargill extracts their water from. This water take supplies >10,000 people and has a volume capacity of 34,500 m³/day. The site is located in the Oreti River

catchment and the Lower Oreti groundwater zone. The NZ Register of Drinking Water Suppliers indicates that it is sourced from the Oreti River.

Wallacetown School (WAL001) is located 15km south west of the dairy platform. This site is located within the Makarewa River catchment and the Makarewa groundwater zone. This drinking water site supplies 25-100 people. According to NZ Register of Drinking Water Suppliers this water is supplied from the Wallacetown School roof.

2. An assessment of effects, including cumulative, of the proposed activities on Registered Drinking Water supplies in the receiving environment.

Wallacetown School

We consider that there could be no adverse effects from the activities for which consents are sought on the roof-sourced drinking water supplies for the Wallacetown School.

Lochiel School

There are many individual property drinking water supplies as well as the Lochiel School water supply (E46/1473, unknown depth, unknown diameter) downgradient from the property.

South Dairy is spread over two main soil types that differ significantly in terms of the predominant contaminant pathways. The predominant Pukemutu soils are poorly drained and the predominant pathway is via runoff and artificial drainage. Conversely, the Edendale soils are well drained providing a transport route to groundwater. The greatest risk to shallow bores used to supply drinking water is in areas with well drained soils in locations with activities that can result in contaminants leaching through soils into groundwater.

The two primary issues for groundwater-sourced drinking water supplies in areas are nitrate nitrogen and faecal indicator organisms (indicators of pathogens, disease causing organisms). The AEE provided with the application explains in some detail how nitrogen losses from the property will be reduced and consequently reduce the risk. The background concentrations of nitrate nitrogen as indicated by the 2007 – 2012 survey indicate that nitrate nitrogen concentrations in this area are between 3.5 – 8.5 g/m³.

The factors involved in influencing the transport of faecal indicator organisms have the added complexity of a range of complex attenuation factors apply to microorganisms that do not apply to dissolved nitrate nitrogen.

It has been recognised for many decades that shallow groundwater in those parts of Southland (and other parts of New Zealand) with pastoral catchment land use is vulnerable to microbiological contamination³. This 1998 study showed that 75% of the wells sampled and

³ Hamil K (1998) Groundwater Quality in Southland" A Regional Overview, Southland Regional Council Publication No 96, 51p.

25% of the bores samples had faecal coliforms detected. This and other studies around New Zealand have demonstrated that shallow bores/wells in areas with well drained soils and pastoral agriculture are vulnerable to microbiological contamination.

The good management practices and mitigation measures that are proposed will result in a significant reduction in N loss to groundwater and in P loss to surface water. It has been generally accepted that a significant reduction in P loss to surface water will also result in a reduction in the risk of microbiological loss to surface water. While we are not aware of any specific research into the consequences for microbiological groundwater quality of mitigation measures designed to reduce N loss to groundwater and P/sediment/microbiological loss to surface water. We consider that it is conceivably possible that some of these mitigation measures could theoretically result in a very small increased risk of microorganisms entering soils and eventually potentially entering the underlying groundwater. For example, recontouring laneways and installing culvert cut-offs to ensure that contaminated surface water doesn't enter surface water means that that surface water runoff is redirected onto soils to allow it to slowly drain into soils.

However, it would be a complex process to then assess the extent to which a small potential occasional increase in microorganism loss to soils could then eventually move into groundwater and then migrate through an aquifer towards drinking water supplies. The scope of this assessment does not allow a quantitative assessment of the potential risks. In the context of the existing relatively high risk of microbiological contamination of shallow groundwater supplies it is highly likely that the increased risk posed by these mitigation measures would be insignificant.

We also note the recent Government Enquiry Report⁴ into the outbreak of campylobacteriosis in Havelock North has made some strong recommendations regarding the risks of untreated drinking water and recommended that all drinking water supplies (including those delivered by self-suppliers) should be appropriately and effectively treated.

Finally, we note that in the s42A report for a since granted, expansion of South Dairy 1 application in Feb 2018, the Consents officer, Emily Allan, concluded that:

"Any potential effects on the water supply are likely to be negligible. The discharge of effluent is not directly to water and the maintenance of buffer zones, along with other mitigation methods, will be required by consent conditions. Provided the conditions are adhered to, then the discharge is not likely to introduce or increase the concentrations of contaminants at the drinking water abstraction point that would cause a breach of standards."

⁴ Havelock North Drinking Water Inquiry (2017) Government Inquiry into Havelock North Drinking Water Stage 2 Report, 286p.

Invercargill Oreti River supply

As noted above, the good management practices and mitigation measures will also result in a reduction in the risk of microbiological loss to surface water. This will reduce the runoff of contaminants to the Oreti River and in particular will reduce the loss of faecal indicator organisms. Therefore, we are very confident that the proposed changes at South Dairy will result in an insignificantly small improvement to the water quality security of the Oreti River sourced water supply for Invercargill. We also note that significant improvements to the quality of the Oreti River will require a comprehensive catchment management approach.

We would be more than happy to discuss the matters raised in this further information response, but trust you now have sufficient information to make a determination on notification of the application.

Yours sincerely,

Matilda Ballinger

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