

13 January 2018

Otago Regional Council
Private Bag 1954
Dunedin, 9054
submissions@orc.govt.nz

cc. Lindis Catchment Group Incorporated
C/- Sally Dicey
PO Box 1320,
Dunedin 9054
sally@mckconsultancy.co.nz

Submission on the Lindis Catchment Group Incorporated

Application for Consents: Application Numbers RM17.301.1 – RM17.301.19

This submission is made on behalf of the Otago Fish and Game Council ('Fish and Game').

Submitter Details

Contact person: Nigel Paragreen, Environmental Officer
Email: n.paragreen@fish-game.org.nz
Office phone: 034779076
Postal address: PO Box 76, Dunedin 9016



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Timing of Public Notification

It is of concern that the public notification period for this application straddles the Christmas and New Year's period. This is a time when people are spending time with family, enjoying holidays away from home and observing cultural traditions. Those with an interest in the applications are therefore less likely to make a submission.

While Fish and Game is appreciative of the applicant's voluntary request for public notification we consider that an extension on the notification period should be provided by the consenting authority to give greater opportunity to potential submitters

Relief sought and relationship to Plan Change 5A

Fish and Game requests the consenting authority provide the relief sought within the submission or any additional, consequential, or other relief which will address the concerns as set out in this submission. Fish and Game acknowledges this application as being inextricably linked with the decisions to be made on PC5A and therefore requests that any concerns / matters raised in this submission should be assumed as equally applying to the broader matters under consideration on PC5A.

Introduction

- [1]** This is a submission on an application from Lindis Catchment Group Limited (LCG) for:
- a. Water permits to take and use surface water
 - b. Land use consent to construct bores
 - c. Water permits to take and use groundwater (connected to surface water)
 - d. Water permits to take and use groundwater
 - e. Transfer of interest in permits, including 'owner' of permit and location of permit

In order to replace permits to take and use water in the Lindis catchment

- [2]** The Otago Fish and Game Council is the statutory manager of sports fish and game bird resources within Otago with responsibilities under the Conservation Act 1987. The primary function under the Act is to manage maintain and enhance sports fish and game bird resources in the interests of anglers and hunters. This includes management of fish and game species as well as protection of habitats such as the Lindis River.
- [3]** Fish and Game is not a trade competitor for the purposes of section 308B of the Resource Management Act 1991.
- [4]** Fish and Game wishes to be heard in support of this submission.
- [5]** Fish and Game would consider presenting a joint case if others make a similar submission.
- [6]** This submission refers to the entirety of the application as notified, which Fish and Game opposes.
- [7]** Fish and Game requests that the consent authority provide the following relief:
- a. decision makers define the existing or receiving environment as excluding the effects of consented activities which are not for indefinite duration and/or which are proposed to be replaced by the activity under consideration;
 - b. volume limits are imposed on the consents which achieve objectives of the relevant planning instruments under the RMA, particularly consideration on seasonal and/or monthly limits;
 - c. rates of instantaneous take suited to local conditions are imposed on the consents and which achieve objectives of the relevant planning instruments under the RMA;
 - d. all intake structures will be designed in a manner so as to prevent disruption of fish migration and the potential for fish ingress or harm at all stages of their life cycle;
 - e. unless they are decommissioned, residual flows on the large race points of take be imposed to ensure ecosystem health, connectivity and natural character immediately below these takes and throughout the main stem. The

specific figure must correspond to any minimum flow to be imposed which is under appeal as part of Plan Change 5A and therefore a number is not suggested presently;

- f. A residual flow of a high percentage of the 7 day mean annual low flow (MALF) be imposed on takes in tributaries to the main stem of the Lindis River, unless additional evidence is presented to justify a lower flow which can provide for natural character and aquatic ecosystems downstream;
- g. where tributaries are proven to be ephemeral, or all affected parties agree that they are ephemeral, a residual flow be provided on a case by case basis based on habitat requirements for aquatic life and the retention of natural character downstream; and
- h. the contribution of water to the downstream catchment be considered as part of the rationale if setting a residual flow.

In stream Values and Natural Characteristics of the Lindis River

- [8]** The Lindis River is a major tributary of the Upper Clutha River joining the Clutha a short distance upstream from Lake Dunstan. The river is an important trout spawning and rearing area for the Lake Dunstan and Upper Clutha trout fisheries, both of which are individually considered to be nationally important. These trout fisheries rely entirely on natural spawning rearing and recruitment to maintain fish stocks and provide angling opportunities.
- [9]** The Lindis is thought to be a significant spawning ground which contributes to Lake Dunstan's brown trout population. However the Lindis's productivity as a spawning and rearing stream is severely impacted by historic over-allocation of water for irrigation. Under existing conditions this results in the river flow disconnecting each year as summer progresses leaving trout and native fish stranded and subject to predation and eventually succumbing to mass mortalities due to lack of water flow. Approximately 10 of the lower 25 kilometres of the river dry out completely. As well as fish mortalities, juvenile fish living in the still flowing waters upstream are unable to migrate downstream to adult habitat areas in the Clutha and Lake Dunstan. As low and/or disconnected river conditions can extend into April, upstream migration of adult spawning fish into the Lindis from Lake Dunstan and the Clutha can also be delayed or prevented.
- [10]** The Lindis does not go dry naturally but throughout its course there are reaches of the lower river where water is lost to groundwater and where flow is gained from groundwater. Loss to groundwater is a feature of the lower 6 kilometres of river with a progressive loss of approximately $0.45\text{m}^3/\text{s}$ of surface flows from a point below the Ardour flow recorder and the Clutha confluence.
- [11]** The river provides habitat for native eels and bullies in the main stem and isolated populations of non migratory galaxiids in some tributaries. While eel populations require fish passage from the sea to complete their life cycle and there are barriers in place, namely hydroelectric dams at Clyde and Roxburgh, the dams' operators have a commitment to address eel passage as part of their resource consents.

- [12] The Lindis sustains a locally important small stream trout fishery in its own right. While the current flow regime means that angling opportunities are mostly early season in the irrigation affected reach, the river contributes to diversity of recreational opportunity.
- [13] The braided river reach below the state highway bridge to the confluence is a habitat for a variety of water birds including pied stilts, black fronted turns and black billed gulls and nesting has been observed on island between braids and rearing of young has been observed on side braids and on river margins. The current flow regime adversely impacts on bird habitat values through the loss of braids of adequate breadth and depth to restrict terrestrial predators and provide secure nesting areas and when the river is depleted or dry through the loss of food production in terms of aquatic insects. Wading birds depart the river reach when flows cease.
- [14] The river is a popular camping destination over the summer period with several large campsites along the Lindis main stem in the irrigation affected river reach and also upstream. Campers often have long term associations with the Lindis but some camp sites become non-viable when flows diminish and cease. The river has important recreational amenity values for campers and picnickers and for children swimming as well as those enjoying the outdoors. It is a relatively safe and attractive small stream environment, which contrasts with the recreational opportunities of big lake and river environments in the area.

Impacts and History of Over Allocation

- [15] As outlined above the Lindis River's natural character, ecology and amenity values are significantly impacted by the historic over-allocation of water within the catchment. This came about through the issuing of 'mining privileges' by the Wardens Court for mining purposes last century and before. Mining privileges were issued without any consideration of environmental requirements of rivers or of the finite capacity of rivers to supply water. The situation which continues to this day is compounded because mining privileges were given a priority ranking so that water not taken by the highest priority right holder was first available to the next highest priority right holder and so on.
- [16] With the passage of the Resource Management Act in 1991, the decision was made to terminate mining privileges and cause a transition to Resource Management Act (RMA) resource consents. Because of the importance of water for irrigation, irrigators were given a 30 year period in which to meet their water needs. All mining privileges lapse on 30th October 2021 and need to be replaced with RMA consents by then.
- [17] New RMA consents will have to comply with minimum flows set in the Water Plan for Otago and there is an expectation that consents will have residual flow conditions included in them that are consistent with minimum flows. This will require less water to be taken than in the past to restore flows which may be achieved by moving to more efficient forms of irrigation, seeking alternative sources of water or changing farming practices.

- [18]** During the 30 year period transition period, the catchment has seen significant changes in irrigation practice and scale – significantly increasing the area under spray irrigation. Unpublished analysis by the ORC found that total irrigation in the Lindis catchment between 2005/2006 and 2013 has increased by roughly 44% and the main method of irrigation had changed from flood to spray. It is very likely that since then spray irrigation has expanded still and in the application more is slated for the future. As noted in the application, spray irrigation equipment often requires stable access to water supplies. Because of this, expanding so dramatically may have introduced an additional element of risk for businesses during a transition process when ongoing access to similar levels of water surety was not guaranteed.
- [19]** There have been over 400 mining privileges in existence across Central Otago so the over-allocation problem caused by them is widespread and affects numbers of rivers and streams. The Lindis is the first over-allocated catchment where applications for RMA consents replacing mining privileges are likely to go before the Environment Court. A number of other applications for consents to replace mining privileges have been settled by negotiation so the Lindis is likely to set the scene for the transition from mining privileges to RMA consents.
- [20]** In the case of the Lindis, Tarras Water Limited was established, applied for and was granted consent for a major water take from the Clutha to supply irrigation water within the catchment. That alternative water source option was likely to take pressure off the Lindis River and to provide for expansion of irrigation as well. However, despite what was described in the media at the time as a viable and compelling business case the scheme did not gain the necessary local commitment from irrigators and did not proceed.

Implications of the assumed 0.55m³/s minimum flow scenario

- [21]** Under the 0.55m³/s scenario presented in the application, the river will look and perform better. It is critically important to differentiate between improving on the status quo, where water rights which are the subject of this application are permitted to run the river dry, and assessing the effects of the application on the existing environment, which Fish and Game does not consider to include the effects of those water rights.
- [22]** The scenario proposed, which is bundled together in the application with the instillation of gallery intakes, would remove the intensive abstraction pressure from the small number of large races and instead transport water downstream to smaller individual takes. Moving to gallery intakes is a positive step which Fish and Game generally supports. The benefit of the additional water going further downstream before being abstracted at the relocated takes will appropriately restore the upper and middle reaches. However, this is essentially traded off against very low 0.55m³/s proposed flows in the lower river.
- [23]** A minimum flow of 0.55m³/s at the Ardour flow recorder is insufficient to protect the ecological functioning of the lower Lindis River. In this reach the impact of water abstraction is compounded by groundwater losses which are estimated at between 0.4-0.5m³/s. This means that 0.55m³/s at the Ardour flow recorder will result in a minimal shallow connection with the Clutha Confluence. In much of the open

riverbed areas downstream of the Lindis Crossing surface water levels will be too low to provide effective habitat for fish life or depth for fish passage. Such a minimal hydrological connection between water bodies does not provide any meaningful connection towards a functioning river system which is envisaged in the suite of 'B' objectives under the National Policy Statement – Freshwater Management.

- [24]** Similarly, the shallow, depleted nature of a $0.55\text{m}^3/\text{s}$ minimum flow scenario below the Ardgour flow recorder will not adequately maintain natural character, especially when considered against the river's hydrological character without abstraction covered by this application. At Ardgour, that natural MALF is listed in the application as being $1.75\text{m}^3/\text{s}$, therefore the $0.55\text{m}^3/\text{s}$ proposal represents just 31% of the average low flows compared to if the abstraction did not occur in the catchment. One impact of this which may be most visible is that the minimum flow proposed is lower than the recommended levels required to provide the appearance of river braids, which has been suggested will be provided at flows of $0.6\text{m}^3/\text{s}$ at the Ardgour recorder. The loss of the appearance of braids in the lower catchment would impact significantly on the natural character of the catchment as a whole. Let alone the ecological functions that braided sections may support which would likely require a higher flow than maintaining an appearance alone.
- [25]** Staff have observed that holding the Lindis River for protracted periods at $0.4\text{--}0.5\text{m}^3/\text{s}$ creates a high risk of excessive periphyton growth that degrades ecological functioning, is aesthetically unappealing and impacts generally on recreational amenity and natural character values. The combination of the proposed $0.55\text{m}^3/\text{s}$ minimum flow, high instantaneous rate of take, allocation amount and annual volume for water metering means that the applicants have the potential to create this outcome. Fish and Game is not convinced that the volunteered condition to provide pulses in specific flow scenarios will achieve an adequate level of flow variability.
- [26]** A literature review of fish passage requirements conducted by the Cawthron Institute recommended a river stretch of one metre should be at least 10cm in depth to ensure young of the year trout fish passage. This review also recommended a one meter length at 18-25cm for yearlings and a one metre length at 20cm for adult trout. Based on these criteria, fish passage in the lower Lindis River is far from optimum at $0.9\text{m}^3/\text{s}$. These criteria provide a useful guide but should not be taken as the absolute minimum depth and width requirements for fish passage. Staff observations indicate that at flows approximating $0.9\text{m}^3/\text{s}$ a spawning run of adult trout were able to migrate through the lower river. These adult fish had been impeded by flows in the range $0.4\text{--}0.5\text{m}^3/\text{s}$ at the Ardgour Flow recorder. Given that adult trout were able to move upstream at flows approximating $0.9\text{m}^3/\text{s}$ it is reasonable to assume juveniles would have a chance of moving downstream under these conditions.
- [27]** Somewhere between $0.9\text{m}^3/\text{s}$ and $0.45\text{m}^3/\text{s}$ at the Ardgour flow recorder all fish passage in the lower river is prevented. Large adult fish passage will be prevented before smaller juveniles. It is most likely that flows around $0.9\text{m}^3/\text{s}$ will be the absolute lowest level that allow adult passage. However this level should be considered far from ideal and stress on fish during passage particularly adults would

be expected. As flows reduce to 0.45m³/s the risk of all fish (including juvenile trout) passage being prevented increases markedly.

- [28]** The result of the 0.55m³/s minimum flow scenario is a loss of key functions in the lower river which support aquatic ecosystems, natural character, landscape amenity and recreational opportunities among other values. Fish and Game have concerns for the provision of such values in the lower river under this scenario, when compared to a scenario without the currently consented abstraction regime.

Outcomes sought by the submission

- [29]** Fish and Game seeks an outcome from this process which provides for the life supporting capacity of aquatic ecosystems and natural character of the river and its tributaries; maintains key ecosystem functions within the catchment; and provides for the economic, cultural and spiritual well being of the local and greater Otago communities, within the natural limits of what the catchment can provide. It is expected that doing so will largely resolve the historical issues Fish and Game have identified and allow for ecosystems to recover from the legacy of over extraction.

- [30]** The rationale for the requested outcomes are based on guidance from the relevant policy documents, most notably:

- a. the RMA
- b. the National Policy Statement – Freshwater Management
- c. the Otago Regional Policy Statement – Proposed and Operative; and
- d. the Otago Regional Plan: Water (RPW).

- [31]** Additional guidance on flow setting is provided by technical documents associated with the proposed National Environmental Standard – Ecological flows and water levels (pNES-EF); however they are not a policy documents. Fish and Game refers to these documents as practical, informative sources.

- [32]** Fish and Game has identified a number of factors which it generally considers when designing a management regime to achieve a specific outcome for a catchment; although, this list is not exhaustive.

Adequate habitat available	Water quantity Provision of cover Suitable habitat for many species and life stages Variety of habitat throughout the catchment
Quality of habitat available	Water quality Type of cover Safety from harm from intake structures

Retaining natural ecosystem functions	Provision of a variety of habitat types Flushing flows Maintaining the food web Fish passage within catchment Fish passage to other water bodies Relationships with groundwater
Retaining natural character	Landscape amenity Nature of the catchment Connectivity Relationship of flow regime to natural flows Relationship of flow regime to natural flow variability
Providing for human uses	Economic well being Spiritual fulfilment Cultural opportunities Recreational amenity Cumulative effects Natural limits on human uses

- [33]** Fish and Game believes the 0.9m³/s minimum flow and associated supplementary flows cited in the ORC Hearing Panel Decision on PC5A provides a bare minimum acceptable standard for the ecological factors listed above. It must be emphasised that this flow regime is far from ideal and represents a significant environmental compromise between in and out of stream uses. However, the PC5A appeal Fish and Game is seeking that the 0.9m³/s minimum flow decision be retained.
- [34]** The application notes that abstraction from several large races causes localised effects on the aquatic environment, even when meeting the 0.9m³/s minimum flow. Under the RPW, it is reasonable that a residual flow be put in place where a minimum flow is unable to provide protection for the aquatic ecosystem and natural character of the source water body. Fish and Game requests that a residual flow which supports the minimum flow decision be placed on takes which have such adverse impacts.
- [35]** Fish and Game is supportive of using smaller gallery intakes as one alternative solution to localised impacts caused by large takes. However, this issue should not be related to the minimum flow decision.
- [36]** Residual flows may also be appropriate for some of the tributary takes. However, Fish and Game staff have had difficulty estimating an appropriate residual flow for each tributary take as staff have not visited many of the streams; the information provided is often lacking in quantitative fishery and age class data; there is a reliance on anecdotal reports to determine naturally occurring dry reaches; and habitat present is not always clearly described. This makes it difficult to assess each tributary's potential value. Where decisions must be made but information is lacking, Fish and Game often uses interim ecological flow guidelines set out in the pNES-EF.

In the case of all tributary takes within this application, this would have a residual flow set at a level which is 90% of naturalised MALF.

- [37]** As Fish and Game staff have been unable to adequately assess the needs of specific tributaries based on the information provided in the application, it requests that, unless additional information is provided to robustly base a decision or staff are able to assess the streams in the field, all tributary takes be set at a high level of naturalised MALF at the point of take.
- [38]** This rule is most easily applied to perennial watercourses. Where tributaries are proven to be ephemeral, or all affected parties agree that they are ephemeral, Fish and Game requests a residual flow be provided on a case by case basis based on habitat requirements for aquatic life, the retention of natural character downstream and the contribution of water to the downstream catchment be considered as part of the rationale for setting a residual flow.
- [39]** In addition, Fish and Game seeks the following outcomes for all consents which may be issued. These are intended to assist in meeting the factors identified above:
- a. all intake structures will be designed in a manner so as to prevent disruption of fish migration and the potential for fish ingress or harm at all stages of their life cycle;
 - b. volume limits are imposed on the consents which achieve objectives of the relevant planning instruments under the RMA, particularly consideration on seasonal and/or monthly limits; and
 - c. rates of instantaneous take suited to local conditions are imposed on the consents and which achieve objectives of the relevant planning instruments under the RMA.
- [40]** The application identifies a number of locations where trout and galaxiid species interact. These situations require additional attention and multi-agency response as many statutory bodies are affected. Fish and Game would like to work closely with the applicants, the Department of Conservation and Iwi in the long term to manage all populations involved and promote conditions where they can flourish. To achieve this result, a consent condition may be utilised or the relevant parties could develop agreements outside the consenting process.

General deficiencies in the application

- [41]** Fish and Game believes that the application is not consistent with the relevant statutory plans and part II of the Act. As a result, application will not adequately avoid, mitigate or remedy the impacts of the activities proposed.
- [42]** The minimum flow appeal is closely tied to this application and the application itself refers repeatedly to two scenarios considered by expert witnesses caucusing during the appeal mediation. Fish and Game notes that these scenarios are not exhaustive and, outside of that mediation process, no party is bound to choose exclusively between the two options. The 0.9m³/s scenario modelled in this exercise is not a realistic scenario and the comparison is not helpful or valid in determining the appropriate minimum flow for the Lindis. This is because it does not apply the

primary allocation rate as determined by the Commissioners' decision and it does not account for any residual flow conditions which should be applied in order to protect significant values. However, the application does read as if there is a binary choice which is incorrect and may invite the decision makers to frame their rational decision to the options presented, ignoring others.

- [43]** There is uncertainty regarding the accuracy of surface flow records, and surface to ground interactions along the lower 25 km of the Lindis River. There have been problems with the Ardgour flow recorder and the dataset has been amended several times. Making correlations between flow levels and available habitat is complicated by changes in abstraction levels, irrigation recharge, and points of take depending on the season. These factors should be taken into account when considering the potential flow regime and an appropriate level of precaution should be applied.
- [44]** The application proposes having no residual flows where naturalised flows are thought to not connect permanently to the Lindis main stem, that is when MALF = 0 for at least one stretch of the tributary. Fish and Game does not agree that a break in connection at one point means that there are no values in the tributary which would be required to be provided for by a residual flow.
- [45]** Eel migration has not been adequately considered within the application. Eels are found in the catchment currently, have been present historically and Fish and Game expects them to be a part of the upper Clutha catchment in the future due to mitigation requirements on major Clutha Dam consent conditions. As such, they should be provided for as part of residual flow setting processes.
- [46]** The application is deficient in information for key areas, making it difficult to assess these parts of the application, these are:
- a. Historical water use for individual takes which previously abstracted from the race systems;
 - b. information on the ecology and hydrology of tributaries, along with requirements for residual flows and rationale for setting residuals at the levels suggested; and
 - c. the hydroelectric generation proposal for takes 13 and 14.
- [47]** The applicants have identified several key impacts of abstraction activities under the 0.9m³/s minimum flow scenario that are proposed to be mitigated under a 0.55m³/s scenario but would not necessarily be addressed under the 0.9m³/s scenario. Fish and Game believes that these should be considered regardless of the minimum flow decision. A non-exhaustive list of the impacts includes:
- a. point depletion in flows from large races impacting on social, cultural, visual, and ecological values;
 - b. harm or ingress of aquatic life into intake structures;
 - c. inefficiencies in ageing race systems causing significant losses of water;
 - d. visual impacts of intake structures on visual amenity and natural character; and
 - e. disruption of fish migration pathways.

- [48]** The application heavily relies on a single estimate of water required for spray irrigation per hectare per year to calculate the efficient allocation limits. This is sourced from a 2006 Aqualinc report, yet the figure is selected from the Manuherikia which may have a range of different factors to the Lindis which could influence water requirements. Fish and Game is not satisfied that the justification provided by the applicant is sufficient to select this figure, which brings into question the required annual volumes requested in the application.
- [49]** There is a logical inconsistency between the historical surety of supply figures cited by the ORC Hearing Panel for PC5A of ~80% in an average year and ~60% in a dry year, and the claim by the applicants that the proposed surety of supply of ~89% under the 0.55m³/s scenario is a bare minimum. As discussed above, in recent years when surety was historically lower than in the proposal, irrigation has expanded dramatically in the catchment. This inconsistency highlights the complexities of profitable investment in spray irrigation infrastructure in the catchment which is not fully explained by the application.
- [50]** The application does provide an economic analysis of the proposed activities under the two scenarios proposed. This demonstrates there is a financial value in the water used by commercial interest. Conversely, there's also an opportunity cost which can be valued in the subsequent loss of public amenity and ecosystem health that would otherwise had been present if water remained in the river. When carrying out an economic analysis, revenue and employment losses cited in the application cannot be viewed in isolation and will be offset by gains in other areas, to a range of different stakeholders. Although they are difficult to measure objectively, the losses and gains to the public through a range of values, such as ecosystem health, amenity values, landscape values or existence values, should be kept in mind when assessing economic values.
- [51]** The applicant has failed to assess the cumulative effects of the proposal in light of likely predicted changes in the region due to climate change.