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1 March 2018

Otago Regional Council
70 Stafford Street
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Attention: Peter Christophers and Brent Cowie

Dear Peter and Brent

Lindis Catchment Group Incorporated response to request for further information under section 92(1) of the Resource Management Act 1991 – Consent No. RM17.301.01

1. This letter supplies the further information requested in your letter dated 25 January 2018, and follows the order of questions set out in that letter.

Incomplete Applications

Hydro-electricity generation – Emmersons and Rutherfords

2. The Emmersons are seeking a permit to take and use water within supplementary allocation pursuant to Rule 12.1.4.3 (as amended by Plan change 5A). The Rutherfords are seeking a permit to take and use water within primary allocation pursuant to Rule 12.1.5.1.

3. As these applications form part of LCG's overall application to replace permits on a catchment wide basis, these applications have been 'bundled' together, along with all the other activities that form part of LCG's application. This means that the activities applied for by the Emmersons and Rutherfords are considered as discretionary activities.

4. Both the Emmerson and Rutherfords are seeking the inclusion of "hydro-electricity generation" as part of the 'purposes of use' on their permits.

5. In both cases the generation device would be located outside of the waterway, and would not impact on the intake design and water would be taken within the rate and volume requested for these permits. The rate and volume being sought for both of these permits has been calculated on the basis of an efficient use of water for irrigation, as outlined in the application, and so taking and use of water for the purpose of hydro-electricity generation is incidental to the primary purpose of taking and use for irrigation.

6. The Emmersons abstract water from the dam on Station Creek shown in Figure 14 of the LCG's application (see also Appendix C, Take Point 1). Water is gravity fed from this dam to the irrigation area which is situated on a lower terrace. The hydro-electricity generation device would be installed at the end of the race (just prior to the irrigation area), to maximise the fall from the dam to the lower terrace and the potential for electricity generation.

7. The Rutherfords propose to take water from their intake on Waiwera Creek and convey it by pipeline to a storage dam, with the generation device located at the end of the pipe. Water would pass through the generation device before entering the dam. A specific design for the hydro-electricity generation has not been undertaken by either party.

8. The inclusion of hydro-electricity generation within the purpose of these consents will not create any effects on Station Creek or Waiwera Creek beyond those described in LCG's application. The mitigation measures proposed in the application will apply to the taking and use of water from these creeks, regardless of the purpose of use.

9. The application highlighted the policy support for renewable electricity generation as contained in the National Policy Statement for Renewable Energy Generation 2011 and the Proposed Regional Policy Statement (p91 and 92 of the application).

10. Generation of electricity will not create any effect (including both the scale and type of effect) that is different than those caused by the taking of water for irrigation and storage on Station Creek or Waiwera Creek. The effects of taking water from tributaries, including Station Creek and Waiwera Creek were addressed in Section 10 and Appendix D of LCG's application.

11. The details of the activity provided here, combined with the information and assessments provided in the application are considered sufficient to complete this application. We request that the ORC reconsider its determination that these are incomplete applications.

Land Use consent to construct a bore – Cookes

12. The Cooke's farm is split across 3 parcels of land. The application to construct a bore relates to the Cooke's Tomich Hill Block which is located adjacent to State Highway 89, just to the south of Tarras. This block is currently irrigated using a branch of the Tarras Race known as the Mackay Race, and receives up to 21 l/s via this race from LIC.

13. Under LCG's proposal the Tarras Race will be disestablished and this property will no longer by supplied with water from LIC. In addition, as a result of Plan Change 5A this block is no longer within the Lindis catchment (as defined by Maps B4 and B7 of the Plan Change).

14. To replace the LIC Tarras (Mackay branch) Race water that will no longer be available to this block, the Cooke's are proposing to establish a small groundwater take for 15 L/s.

15. LCG's application only seeks consent to construct a bore (referred to as T5 in the application) on the Tomich Hill block. This approach acknowledges that this bore is the only proposed bore that is not located in the Lindis Alluvial Ribbon Aquifer, and therefore less is known about hydrogeology in the vicinity of T5.

16. Accordingly, LCG's application sought consent to construct this bore, so that pump testing could be carried out in order to obtain sufficient information about hydrogeology at this site. This is outlined in Section 8.5.1.2 and 8.5.1.4 of the application. While all of the activities included in LCG's application have been 'bundled' as discretionary activities, it is worthwhile noting that the construction of a bore is a controlled activity under Rule 14.1.1.1. The matters to which control is limited to in this rule are still relevant in determining the information required to grant consent within the ambit of LCG's application. These matters are listed on p99 of the application and are:

    a. The location of the bore including its relationship to other bores and other activities; and
    b. The planned depth of the bore; and
    c. The management of the bore head and maintenance of the bore; and
    d. The nature of the bore; and
    e. The method of drilling or excavation; and
    f. The duration of the resource consent; and
    g. The information and monitoring requirements; and
    h. Any bond; and
    i. The review of conditions of the resource consent.

17. As noted on p65, the specifications of T5 will be as follows:
    - Bore diameters: 150mm - 400mm depending on the expected yield
    - Estimated depth: 20 metres (or deeper for T5)
    - Estimated casing depth: 17 metres to allow for a 3 metre screen
    - Casing material: Steel
    - Method of drilling: Rotary
    - Method of construction: Percussion
18. The application also noted at p65 that the bore would not be constructed within 50 metres of known contaminated sites, septic tanks/outfalls or long drops. Nor is the location of T5 within a known historical site, or a site known to be of cultural or spiritual significance to iwi.
19. T5 would be located more than 50 metres from the property boundary.
20. A draft consent to construct bores which would replace allocation from LIC, including T5, is included within Section 13.1.1 of the application. In addition, Section 13.1.1.3 includes general consent conditions to be included with all consents to construct a bore. A number of these are included to address the matters of control in Rule 14.1.1.1. The proposed conditions include the following:
    i. All bores to be located more than 50 m away from a property boundary
    ii. All bores to be site so that cause acceptable interference on neighbouring bores, as assessed by a hydrogeologist, with this assessment to be provided to the ORC. A condition to this effect was included to provide LCG with sufficient time to undertake this assessment, as this work had done been carried out prior to lodging the application.
    iii. Work carried out during the construction of the bore shall be in accordance with the relevant New Zealand Standard.
21. With reference to the matters listed in Rule 14.1.1.1, the information provided in the application is considered sufficient for the application to construct Bore T5 to be complete. We request that the ORC reconsider its determination that this is an incomplete application.

Collated Information

22. The collated water use information is provided in Attachment 1, as requested in your letter. This provides details of existing water use, and proposed water use based on LCG's proposal.

23. It is difficult to provide a timeline of changes to irrigation techniques, except to say that majority of the proposed development is dependent on the outcome of this process, including setting the minimum flow at 500 L/sec.

24. Properties which will need to establish a new take (as part of the gallery project) to replace existing LIC race water will need to change irrigation infrastructure at the same time, as this water will no longer be gravity fed but pumped to the irrigation area. It is uneconomic to irrigate via overland flow from a pumped supply. The large scale of on-farm changes required as a result of the gallery project highlights the need for a 5 year transition period.

25. Other properties will need to establish storage to enable supplementary allocations to be used. The development of storage is expensive, and so can be dependent on a range of economic factors, including debt loadings and the market value of products. However the loss of reliability the will result from the minimum flow acts will act as a strong incentive for the development of on-farm storage in the few places where it is feasible in the catchment.

Water Use

Aqualinc

26. As noted in previous communications with you, the ORC commissioned a review and update of the Aqualinc 2006 report entitled: "*Water requirements for irrigation throughout the Otago Region".* This has resulted in the Aqualinc, 2017 report: *"Irrigation Report - Guidelines for Reasonable Irrigation Water Requirements in the Otago Region".*

27. We have assessed the annual demand for irrigation water based on the 'maximum' seasonal volumes in Table 5 of Aqualinc (2017). Efficient irrigation operates on the principle of putting a little on often. Applying any of the other annual demands (Average, 80th percentile or 90th percentile) from Table 5 of that report could mean that seasonal volume is most likely to be reached towards the end of an irrigation season due to maximum monthly volume constraints. This could halt water use in March causing stress to crops and placing them at risk. This is illogical if all the environmental controls that are in place to protect the values are being met and the water required is available.

28. LCG has proposed residual flows where appropriate and a minimum flow of 550 l/s including a significant reduction in actual water use to meet a catchment primary

allocation of 1650 L/sec. Furthermore LCG has invested in significant irrigation infrastructure. These environmental controls will be in place to protect the values associated with the Lindis. On this basis if water is required and available to efficiently irrigate then the use of the maximum annual demand figure is considered appropriate.

29. A property by property assessment of the annual demand for the proposed command area is included as Attachment 2. Mean Annual Rainfall (MAR) for the Lindis catchment command area ranges for 450mm/yr to 750mm/yr under Aqualinc (2017) with the majority of irrigation area having a MAR of 550mm/yr. Plant available water (PAW) to 600mm values range from 40 to 120 across the irrigation area. Based on Aqualinc, 2017, the range of annual volumes required for efficient irrigation in the catchment ranges from 7140 m^3/Ha/yr to 8750 m^3/Ha/yr with the requirements for the command area averaging at 8243 m^3/Ha/yr, although the bulk of the command area averages at 8101m^3/Ha/yr. Therefore the value of 8100 m^3/Ha/yr used in the original application is considered a fair value to be used across the catchment.

How applicant proposes to use water with a minimum flow of 900 L/s throughout the river

30. As noted in Section 7.1.2.1 of the application, a minimum flow of 900 L/sec will result in the gallery project becoming uneconomic as surety of supply to run efficient spray systems would be too low at ~75% and would result in existing efficient irrigation infrastructure becoming redundant for most of the season. As the gallery project would not be feasible under a minimum flow of 900 L/sec, the operation of the gallery project whilst maintaining 900L/sec throughout the river is not addressed in detail here – instead only the operation of the large race intakes is addressed.

31. A minimum flow acts as the control point for the whole river, and the flow required at this point will not be achieved “throughout the river”. For this reason, in setting a minimum flow (and in complying with it) it is important to understand the relationship between the control point and the hydrology of the rest of the river, including different gaining and losing reaches.

32. The hydrology of the Lindis River is well understood and well documented in Rekker (2017). For example, evidence from all parties at the ORC hearing on Plan Change

5A accepted and acknowledged that there would not be 900 L/Sec throughout the lower losing reach with a minimum flow of 900 L/sec at the Ardgour flow site, due to the significant losses. The Joint Witness Statement (2017) shows that there is agreement between experts that with the losses in this reach a minimum flow of 900 L/s provides a flow of ~450 L/sec at the Clutha confluence (Joint witness statement 2017).

33. The same logic is true for the upper losing reach. Conservatively if all the flow recorded at the Ardgour minimum flow site came from the upper catchment (assuming no additional gains from tributaries or groundwater below Ardgour Bridge) there would be ~450 L/sec of surface flow throughout the upper losing reach with a further 450 L/sec flowing subsurface. The effect of having to maintain 900 L/Sec throughout the Lindis River for access to water is outlined in detail below.

Operating the large race intakes under a minimum flow of 900 L/sec and maintaining 900 L/sec throughout the main-stem as requested by Fish and Game.

34. Under the Regional Plan: Water for Otago an individual can take water as long as the relevant catchment minimum flow is being met. In over-allocated catchments ORC has promoted working as groups to develop sharing regimes which allow water users to share water at low flows, while providing for instream values and maintaining good access to water across users and reducing conflicts amongst users. Working as a group allows a more innovative approach to managing the effects of takes and conflicts between users than just relying on minimum or residual flow conditions. The recognition of these benefits underpinned the 1C plan change to the Regional Plan: Water (which became operative in 2012) in preparation for the transition from deemed permits in catchments like the Lindis.

35. It is expected that working as a group provides the opportunity for a catchment-based approach that:
    - Makes best use of the resource.
    - Can take advantage of specific hydrology to mitigate the effects of taking.
    - Can use sharing and subsequent conveyance to downstream users to mitigate the effects of taking.
    - Provides flexibility between users for better water management during times of water shortage.

36. Working together at the catchment scale provides options that do not exist if rigid flow conditions are developed that isolate water users from each other. Working as a group provides the opportunity for less conservative flow controls especially if they are only applicable for short river reaches or only occur for relatively short periods of time. This then affords users increased flexibility to share water during times when water is short and competition between users is greatest. The Fish and Game request of applying the minimum flow of 900 L/sec and maintaining 900 L/sec throughout the main-stem effectively removes any opportunity for the Lindis water users to work collectively going forward.

37. The combination of a minimum flow of 900 L/sec and residual flows at all mainstem takes of 900 L/sec would significantly reduce surety of supply during the irrigation season. Most of the water taken (>90%) under the existing abstraction regime is from upstream of the upper losing reach immediately above the Ardgour Bridge.

38. To ensure at least 900 L/sec is maintained throughout the upper losing reach immediately above Ardgour Bridge there needs to be ~1300 L/sec at the Rutherford's flow site due to ~400 L/sec loss to groundwater below this site. Assuming Cluden Stream is contributing ~100 L/sec, water users above Ardgour Bridge would need to begin rostering when flows at Lindis Peak are ~3650 L/sec to maintain 1300 L/sec at Rutherford's flow site. Taking above Ardgour Bridge would need to cease when flows are 1200 L/sec at Lindis Peak flow site (assuming 100 L/sec inflow from Cluden Stream) to ensure 900 L/sec is maintained through the upper losing reach. Having to maintain at least 900 L/sec in the upper losing reach would result in a surety of supply of ~48% for the main-stem water users above Ardgour Bridge during the irrigation season, a ~20% reduction in surety based on the current regime with no minimum flow.

39. Water users below Ardgour Bridge would be able to access their full entitlement under a minimum flow 900 L/sec and maintaining 900 L/sec throughout the Lindis River until inflows at Lindis Peak fall to ~800 L/sec. This is because the takes above Ardgour Bridge would have to cease taking when Lindis Peak flows were ~1200 L/sec or less allowing all the inflows to pass. Even if natural flows are unable to maintain 900 L/sec in the upper losing reach, takes below Ardgour Bridge could operate as long as they were leaving 900 L/sec immediately below their take and

meeting 900 L/sec at the Ardgour flow site. This could happen as the stretch below the bridge is a gaining reach. To meet these criteria inflows at Lindis Peak would need to be at or above ~800 L/sec as the current maximum consented rate of take of between Ardgour Bridge and the Ardgour Road flow site is only 164 L/sec. This approach would result in a surety of supply of ~99% for the main-stem water users below the Ardgour Bridge.

40. Having to maintain 900 L/sec throughout the river (not just at the minimum flow site) simply removes all flexibility to manage access to water at times of low flow and effectively splits the catchment group in two, those with water surety to irrigate efficiently and those without, with the most adversely affected being the users above the Ardgour Bridge. The low supply security for those users above Ardgour Bridge would leave existing investments in efficient infrastructure stranded and prevent further upgrades being made.

How the large races will be operated with a minimum flow of 900 L/sec at Ardgour Road flow site.

41. A minimum flow of 900 L/sec at Ardgour Road reduces existing primary allocation surety of supply during the irrigation season for main-stem water users from ~70% to ~50%, this is because the water relinquished to deliver the minimum flow is the most reliable. In the case of the Lindis, a minimum flow of 900 L/sec accounts for all the 100% reliable water. This means that land that had 100% supply security and could be relied on in every season for securing winter feed crops now has at best ~84% secure water, and this introduces significant risks for the water users and how they run their businesses.

42. Where existing infrastructure is in place such as a pivot, reducing supply security from 100% to 84% there will be significant implications for production and returns on investment. Aqualinc (2016) provide advice that most new irrigation schemes in New Zealand are designed to deliver 95 – 98% supply reliability and that a reliability of below 95% can restrict land use options which in turn restricts investment in new irrigation infrastructure. This can be interpreted to mean that for existing infrastructure such as pivots, reducing security below 95% is a significant risk.

43. By imposing a minimum flow of 900 L/sec at Ardgour Road there is simply not the water security to be able to run the existing spray systems effectively, nor invest in the capital outlay for piping and pumping to decommission the existing races. With the low surety due to the 900 L/sec minimum flow severely limiting efficient spray systems the choices for the water users become limited. They can either stop irrigating completely or use the low surety resource by maintaining the large gravity feed races that are in place and irrigate via border dyke and contour flood.

44. This is because border dyke and contour flood irrigation lend themselves to more opportunistic access to water than that of spray systems, pastures under them can tolerate longer return periods (up to 20 days between watering) and they don't require the significant capital investment or power costs of spray methods such as pivots. The large races would be able to convey large rates and volumes of water when it is there and make use of any freshes that occur through the season to get water onto relatively large areas of land quickly relative to spray systems.

River Flows

Closure of Tarras, Ardgour and Beggs Stackpoole Race

45. Although your letter only asks about the above races, we also include information about the closure of the Rutherford's race.

46. We anticipate that the Beggs Stackpoole Race and Rutherfords race are likely to close earlier than the 5 year timeframe requested. This is because the proposed replacement of a portion of the allocation from these races involves only 3 permit holders (those associated with R13, B1 and B2).

47. The Beggs Stackpoole Race may be able to be closed within a 2 year timeframe.

48. However, in the case of R13 the Rutherfords cannot complete their upgrade until the Ardgour Race is removed from their land, as irrigation cannot occur in the vicinity of the race. Accordingly, a five year time frame is requested for the closure of the Rutherford's race.

49. A five year timeframe is also requested for the closure of the Ardgour and Tarras Races.

50. The five year timeframe is considered to be very tight given that closure of the Ardgour and Tarras Races is associated with the disestablishment of a community

irrigation scheme that has been in existence for generations. This adds considerable complexity to the process. LIC will need to meet its existing legal responsibilities to its shareholders in the most, fair and equitable way while progressing changes that will disadvantage current water users and lead to large costs for upgrades. In establishing the new takes and related infrastructure, relevant LIC members will also need to formulate agreements relating to shared water transport systems, cost arrangement between parties and ongoing management and costs before commencing the change-over.

51. There will be substantial works required to establish the new intake sites and associated infrastructure as outlined in p57-58 of the application. Easements a required for a number of new sites. Closure of the races cannot occur until the last easement is in place and all new intakes and associated infrastructure is established.

Inclusion of interim measures to mitigate effects of large race intakes

52. Abstraction associated with the large race intakes occurs under deemed permits, which are due to expire on 1 October 2021. Under the policy framework in the RPW, minimum flows are effectively applied to deemed permits (or their replacement permits) at that date. This means the current regime of abstraction could occur until that time, with no requirement to mitigate the effects caused by that abstraction. LCG is seeking the granting of replacement consents by the end of 2018, with a 5 year transition period (with no minimum flow applying) ending in 2023. This effectively adds an extra 2 years beyond the 1 October 2021 deadline.

53. The addition of fish screens to the large race intakes for the 5 year transition period (or 2 years beyond 2021) would be impractical and expensive. Selection of suitable design would be challenging and very expensive, given the size of the intakes and the large flashy flood flows (carrying debris) that can occur in the Lindis. By the time a suitable design was selected and installed, LIC are likely to be close to dis-establishing the races.

54. Applying residual flows to the races would significantly reduce supply security for during the 5-year transition period. This would reduce production which would result in a lowering of income, at the same time significant expenditure would be required to carry out the whole-farm infrastructure system upgrade needed to implement the gallery project. This loss of income during the transition period could delay or put the gallery project at risk. Rather than spending significant amounts of money on altering existing infrastructure that has a use life of less than 5 years, that capital should be

invested in the new infrastructure which deals with the adverse effects caused by the existing races.

55. No other interim measures to manage the effects of the large races are proposed by LCG within the transition timeframe. LCG are committed to minimising the transition timeframe as much as possible, and will be supporting its members to make the changes required.

Basis for Residual Flows in Cluden and Waiwera Streams

56. Attachment 3 outlines the basis for the residual flows proposed for Cluden and Waiwera Streams.

Residual flow necessary to maintain flows all year around in upper losing reach

57. Where your letter refers to the 'Rutherford's reach' we note that this is commonly referred to as the 'upper losing reach' (as referred to in LCG's application), and for the sake of consistency and clarity we use the latter.

58. Flow gauging's carried out by Otago Regional Council in February 2017 show that flows greater than 300 L/sec are required at the Rutherford's flow site to maintain surface flows throughout the upper losing reach.

59. Further flow gauging information suggests that at flows of 400 L/sec or more at the Rutherford's flow site surface flows of at least 100 L/sec are maintained throughout the upper losing reach.

60. Rekker (2017) models additional loss of ~ 50 L/sec upstream of the Rutherford's flow site. Therefore, based on this additional loss and the losses below Rutherford's flow site residual flows of 550 L/sec below the Tarras and Ardgour Races would maintain at least 100 L/sec throughout the upper losing reach, assuming no other water users were taking between the Ardgour Race intake and the upper losing reach.

National Policy Statement for Freshwater Management 2017

61. The NPSFM aims to recognise the national significance of fresh water by promoting the sustainable use of water, through the setting of limits based on a more nationally consistent approach that is scientifically robust.

Water Quantity

62. Objectives B1, B2, B3 and B5 of the NPSFM are particularly relevant to this application. These objectives are analysed within the context of LCG's application.

Objective B1: To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming, or diverting of fresh water.

63. This proposal will provide for life-supporting capacity, and the healthy functioning of ecosystem processes, through the reduction of abstraction and the implementation of minimum and residual flows and the disestablishment of the large race intakes. LCG's proposal will result in contiguous flows throughout the river (with the majority of the Lindis carrying flows above 750 L/sec during low flows) and will significantly reduce the extent and duration of low flows in the reaches of the river affected by abstraction. This is achieved by tailoring the proposal to the specific hydrology of the mid to lower Lindis. The result is that the applicant's proposal mitigates the effects of taking water for a much larger length of river than a minimum flow of 900 L/s.

64. Under this proposal the effects on flows will be most noticeable in the lowest 4.5 Km (below Ardgour flow site) where groundwater losses reduce flow below 550 L/sec (Figure 39). However, this needs to be kept in context with the quality of fish habitat in this reach. Habitat quality for fish in the Lindis downstream of Lindis Crossing Bridge at flows below the natural 7-day MALF has been identified as notably worse than upstream due to a combination of physical factors, periphyton and fine sediments (Joint Witness Statement in Appendix A of the application document).

65. Overall the improvements to flows will safe-guard the life-supporting capacity of the river and will provide a healthy functioning eco-system.

66. Where appropriate, residual flows have been proposed for intakes located on the tributaries, as outlined in Section 10 of the application, and this provides for and enhances life-supporting capacity in these waterways.

Objective B2: To avoid any further over-allocation of fresh water and phase out existing over-allocation.

67. The allocation of water in Otago is managed via the Otago Regional Council's (ORC) Regional Plan: Water for Otago (RPW). The RPW manages allocation via 2 categories – primary and supplementary allocation. In already over-allocated catchments, primary allocation status is afforded to takes which were first granted (or applied for) prior to February 1998. New water takes within these catchments can only be applied for as supplementary allocation. Water takes with primary allocation

status essentially have a higher priority, as water can be taken at lower flows than takes with supplementary allocation status.

68. A small amount of supplementary allocation water (753 L/s) is sought through this application, much of which is in replacement of primary allocation water, or to address (albeit in a limited fashion) the reduction in reliability of supply from the minimum flow sought in the application of 550 L/sec. This is not considered to be further over-allocation, as the ORC has deemed this water to be available for abstraction on the basis that it is only available to be taken when flows are higher and sufficient water is available.

69. Under the RPW, it is not possible to seek new primary allocation water in the Lindis catchment. Therefore further over-allocation of freshwater is avoided.

70. As noted in the application document, this application represents a significant reduction in the total primary allocation within the catchment, both in terms of instantaneous rates of abstraction and annual volume, as shown in Table 32 of the application document.

71. The reduction in allocation proposed by the applicant is only possible with the reliability of supply that will result from a minimum flow of 550 L/sec, as sought by the application.

72. Accordingly, LCG's proposal will result in a notable reduction in allocation, and is considered to be consistent with Objective B2.

73. Objective B2 uses the words "***phase out*** *existing over-allocation" [emphasis added].* This wording recognises that existing over-allocation needs to be reduced gradually, to allow for changes to occur. This includes changes to community behaviour, infrastructure, investment, and (particularly with regard to deemed permits), to allow re-consenting to occur.

74. This is acknowledged in the preamble to the NPSFM which states: "Where changes in community behaviours are required, adjustment timeframes should be decided based on the economic effects that result from the speed of change." (p4)

75. The RPW has a sinking lid approach which gives effect to the phasing out of existing allocation. This approach is created by a combination of policies and rules including the application of the primary allocation limit (which prevents new permits to abstract water except when flows are higher), and the non-replacement of allocation which has not actually been utilised (often referred to as 'paper water') and proactively

bringing about the surrender of 'unused' consents. The sinking lid approach allows for a gradual phasing out over time, as consents are replaced and reviewed, and is considered to be consistent with, and give effect to the NPSFM.

76. However the primary allocation set by Plan Change 5A for Schedule 2A, as with any primary allocation limit included in this Schedule, is aspirational in nature. This is because under Policy 6.4.2 the primary allocation limit for any catchment is to be defined as the ***greater*** of (in simple terms) the limit specified in Schedule 2A or the sum of consented takes (granted prior to February 1998 for surface water of April 2010 for connected groundwater). In an over-allocated catchment it will be the latter of these, and will remain so until over time the replacement or surrender of consents means that sum of consented takes is less than the Schedule 2A limit. This process may take some time as it recognises the rights of existing permit holders, and the importance of a security of supply for these permit holders.

77. The replacement of almost all permits in the Lindis catchment in a cohesive manner at the same time provides an opportunity to make a significant reduction of over-allocation.

78. Nevertheless this reduction requires significant changes to community behaviours, with corresponding costs and economic effects. The reduction in allocation proposed in LCG's application is dependent on a minimum flow of 550 l/s, which provides sufficient security of supply to enable the gallery project. This will result in the dis-establishment of the large race intakes which in turn will facilitate the reduction in allocation proposed. LCG's members cannot begin these changes in earnest until they know what the reliability of supply is (i.e once the minimum flow is set). Ideally consents will be granted and will commence in late 2018. In this case the five year period requested by LCG to bring about the changes would end in late 2023. This is effectively 2 years past the end date for deemed permits – within the context of the changes being proposed by LCG's application, and the significant improvements to flows and a wide range of values associated with the catchment, this considered to be an acceptable period over which existing over-allocation should be phased out.

79. This five year period is necessary to enable LCG to plan, obtain financing, construct and commission the gallery project, and dis-establish the large race intakes. It is considered to be a very reasonable timeframe to reduce allocation volumes that have been in place for decades, and which will not be replaceable (as primary allocation).

80. Objective CA and corresponding policies set out how regional councils will develop objectives for freshwater water management units that will give effect to the NPSFM.

81. Councils are required to implement the Freshwater NPS in their policies and plans as promptly as is reasonable in the circumstances, and so it is fully completed by no later than 31 December 2025, with the possibility of extending this until 31 December 2030 (Policy E1). This clearly anticipates the time that will be required to amend or develop plans through the Resource Management Act process but also reflects the lead-in time required to bring about change in water management.

82. The ORC is one of only 2 regional council's in New Zealand to report to MFE that it has implemented the NPSFM (http://www.mfe.govt.nz/fresh-water/national-policy-statement/regional-councils-implementation-programmes). The RPW (within the context of the Regional Policy Statement) is the key planning instrument by which the ORC implements the NPSFM, and Plan Change 5A to the RPW was notified after the NPSFM came into effect. Therefore the objectives for the Lindis catchment (as a Fresh Water Management Unit) should be established in accordance with Policy CA2(f) which clearly requires councils to consider, amongst other matters:

> *"v. any implications for resource users, people and communities arising from the freshwater objectives and associated limits including implications for actions, investments, ongoing management changes and any social, cultural or economic implications"*
>
> *vi. the timeframe required for achieving the freshwater objectives, including the ability of regional councils to set long timeframes for achieving targets"*

83. The NPSFM clearly anticipates and allows for long timeframes to be set in achieving targets. In setting timeframes and targets, the NPSFM also allows for the implications for resource users to be taken into account including actions, investments and ongoing management changes.

84. This approach is further supported by the preamble to the NPSFM states:

> *"Where changes in the communities use fresh water are required, the pace of those changes should take into account impacts on economic well-being" (p5)*
>
> and

"where water resources are over-allocated (in terms of quality and quantity) to the point that national and local values are not met, over-allocation must be reduced over agreed timeframes." (p5)

85. While the first quote above is within a paragraph discussing water quality, it is considered to be relevant to water quantity also.

86. LCG sought a sufficient timeframe to be included in PC5A which would allow for the changes required in the Lindis catchment (as an FMU) to achieve the water quantity targets for the catchment, both through consultation with the ORC prior to notification of PC5A and through its submission on PC5A. The ORC did not incorporate this into PC5A.

87. Therefore we consider that the matters which must be given consideration in developing FMU objectives under the NPSFM can instead be given effect to via a consent process. Accordingly, LCG request that pursuant to Policy CA2(f)(v) and (vi) of the NPSFM, the permits sought by LCG include sufficient timeframes to make the changes required to water management within the catchment. The 5 year timeframe sought by LCG is considered to be very tight given the scale of change required.

Objective B3: To improve and maximise the efficient allocation and efficient use of water.

88. There are currently 1,600 ha of spray irrigation in place within the Lindis catchment, about 1,000 ha of which is pivot irrigation. The majority of the remaining 900 ha of the irrigated area within the catchment will be able to be converted to efficient spray irrigation if a minimum flow of 550 L/sec is implemented.

89. The ability to utilise existing efficient irrigation systems or to finance the development of new efficient irrigation infrastructure is dependent on sufficient reliability of supply. A minimum flow of 550 L/sec will result in a reliably of supply which will make investment in efficient irrigation infrastructure challenging but possible.

90. Poor water reliability from a minimum flow greater than 550 L/sec will result in many cases where it will not be possible to utilise or fully realise the potential of existing efficient infrastructure as these systems are not designed to be used intermittently – if they are used intermittently then production of pasture declines or is placed at risk of failure. Financing of new efficient infrastructure will not be possible to finance efficient irrigation infrastructure as the production returns are too risky.

91. If the minimum flow is **greater** than 550L/sec then the reliability of water (less than approximately 89%) is such that the change cannot occur and the LIC irrigators will

have to keep using the old races. This would result in LCG seeking to retain a significantly larger portion of the existing primary allocation than has been proposed by the application, as shown in the table above.

92. The applicant's proposal will result in sufficient reliability of supply to enable improvements to, and maximisation of the efficient allocation and use of water, and is considered to be consistent with Objective B3.

93. As with a reduction in allocation, improvements to efficiency as a result of LCG's proposal will take time to bring about, given the work required to establish the gallery project and dis-establish the large race intakes. As discussed above in relation to Objective B3, the NPSFM anticipates and allows for a period of transition by which to meet targets, including efficiency targets.

Objective B5: To enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing fresh water quantity, within limits.

94. As noted in Section 10 of the application document, the implementation of a minimum flow on the replacement consents will result in adverse economic effects on the farming businesses that will be subject to a minimum flow, due to the decrease in reliability of supply. However the applicants acknowledge the necessity of a minimum flow restriction to enhance a range of values associated with the Lindis River.

95. Continued access to water for irrigation at the level of reliability created by a minimum flow of 550 L/sec will limit the adverse economic effects to an extent that will still enable current farming businesses to remain economically viable, while also sustainably managing fresh water.

96. The proposal put forward by the applicant includes a range of measures, including a minimum flow, residual flows on tributaries, reduction in allocation and disestablishment of large race intakes and establishment of gallery intakes. These measures aim to maximise the potential for positive effects on the values associated with the River, while also aiming to keep the adverse economic effects that will result from a decrease in reliability of supply to an acceptable level.

97. The application is considered to be consistent with this objective.

Water Quality

98. In setting objectives and limits in accordance with the National Objectives Framework (Objective CA1 and corresponding policies of the NPSFM) regional council's must manage for 2 compulsory values - ecosystem health and human health, and can also recognise and manage freshwater for a range of other national values. In doing so, the objectives and limits in regional plans must be set at an attribute state (as contained in Appendix 2 of the NPS, required by Policy CA2) at or above the minimum acceptable state for that attribute (CA2(d)). In addition, Policy CA3 requires regional councils to ensure that freshwater objectives (and corresponding limits) for the compulsory values (eco-system health and human health for recreation) are set at or above the national bottom lines for all FMUs.

99. In the case of water quality this means the ORC must set targets for contaminant levels that are at or better than the minimum acceptable state or national bottom line as contained in Appendix 2 and 6 of the NPSFM while also ensuring that values already identified for a FMU will not be worse off when compared to existing freshwater quality (Policy CA2).

100. The process set out in Policy CA2 (to develop freshwater objectives) may not have been followed explicitly, as the ORC's water quality limits came into effect prior to the NPSFM.

101. Notwithstanding this, ORC has assessed all the contaminant limits contained in Schedule 15 of the RPW as being more restrictive than the national bottom lines specified in the NPSFM (due to differences in monitoring regimes under the 2 documents this comparison has to be done by regression). While Schedule 15 does not include limits for all attributes specified in Appendix 2 of the NPSFM (of which Periphyton and Dissolved Oxygen are relevant to rivers), the ORC state these will be monitored in the future to assess compliance with the NPSFM.

102. As outlined in Section 10.5 of LCG's application, State of the Environment reporting has shown that currently only Nitrate-nitrite nitrogen (NNN) at the Ardgour site fails to meet the ORC's Schedule 15 water quality limit.

103. Under the applicant's proposal it is expected that water quality at Ardgour will continue to meet Schedule 15 limits for NH4, DRP, E.coli and turbidity. By providing a continuous flow at all times and reducing abstraction from the Lindis River it is expected that the relative significance of high N groundwater to measured NNN levels at Ardgour will be reduced and these levels will improve significantly.

Objective A1: To safeguard:
a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and
b) the health of people and communities, as affected by contact with fresh water; in sustainably managing the use and development of land, and of discharges of contaminants.

104. Water quality in the Lindis currently safeguards the matters contained in Objective A1. With respect to the actions of LCG members, the historical regime of abstraction and resultant impact on flows during the irrigation season has had the biggest impact on the matters listed in (a) of this objective. While the health of communities was maintained during this historical regime, this value will be enhanced further by the increase in flows that will result from LCG's proposal.

105. On this basis LCG's application is considered to be consistent with this objective.

Objective A2
The overall quality of fresh water within a freshwater management unit is maintained or improved while:
a) protecting the significant values of outstanding freshwater bodies;
b) protecting the significant values of wetlands; and
c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.

106. LCG's proposal will result in the phasing out of over-allocation. As noted in Section 10.5 of the application document, LCG's proposal will result in increased flow of upper catchment water to the lower catchment, and this will result in more dilution and lower NNN concentrations in the lower catchment at the Ardgour site over time. Significant expansion or changes in irrigation area above Lindis Peak are not proposed by the application. Accordingly it is expected that water quality will comply with the RPW Schedule 15 limits for the upper to mid Lindis.

107. It is also expected that water quality at Ardgour (the lower Lindis) will continue to meet Schedule 15 limits for NH4, DRP, E.coli and turbidity. By providing a continuous flow at all times and reducing abstraction from the Lindis River it is expected that the relative significance of high N groundwater to measured NNN levels at Ardgour will be reduced and these levels will improve significantly.

108. Accordingly the overall quality of freshwater within the Lindis catchment is expected to be improved overall, and the application is considered to be consistent with Objective A2.

Objective A3
The quality of fresh water within a freshwater management unit is improved so it is suitable for primary contact more often, unless:
a) regional targets established under Policy A6(b) have been achieved; or
b) naturally occurring processes mean further improvement is not possible.

109. Water quality in the Lindis is expected to achieve regional targets relevant to primary contact, based on water quality and E.coli levels to date (please refer to Section 10.5 of the application) as E.coli is the key attribute relevant for primary contact under Appendix 2 and 6 of the NPSFM for a river such as the Lindis. Furthermore, a reduction in abstraction will improve water quality with respect to the relative significance of high N groundwater to measured NNN levels at Ardgour.

Objective A4
To enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing freshwater quality, within limits.

110. The analysis of Objective B5 applies to Objective A4 also, in that LCG's proposal aims to maximise the potential for positive effects on the values associated with the River, while also aiming to keep the adverse economic effects that will result from a decrease in reliability of supply to an acceptable level.

111. The application is considered to be consistent with this objective.

Smith Family, Tarras Downs Ltd

112. Consent 2001.544 permits abstraction at an instantaneous rate of 138.8 L/sec and 768,000 m^3/year. This consent is being replaced as Take 15.

113. As explained in the application the previous owners of the property had issues with their measuring data as the intake gets disturbed by freshes and floods. This has resulted in a monitoring record which indicates a lower annual volume than was actually abstracted.

114. Rather than request that these issues be taken into account when applying Policy 6.4.2 (which requires that for permits with primary allocation status no more

water should be granted than has been taken under an existing consent in the preceding 5 years), LCG is proposing to transfer part of the LIC Tarras Race water allocation for this property to this take (Take 15), but only by increasing the annual volume to what is considered to be an efficient amount for the irrigated area of 110 ha.

115. Part of the remaining LIC Tarras Race water allocation is sought to be utilised as a new take point to be established (T3). A permit to abstract water as supplementary allocation is also sought for the same site (referred to as T3b). In summary, the Smiths are seeking:

a. From Take 15: replacement of Consent 2001.544 primary allocation combined with a transfer of a portion of the LIC Tarras race water that is supplied to this property). This will be issued directly to the Smiths.

b. From T3: Primary allocation of 20 L/sec and 567,000m^3/annum (as a transfer of LIC Tarras race water that is supplied to this property). This will be held by LIC initially, and is referred to as T3a.

c. From T3: Supplementary allocation of 50 L/sec and 810,000 m^3/ annum. This will be issued directly to the Smiths.

116. Section 13.2.9 only relates to the private permits which will be held by the Smiths immediately following granting of consent. This constitutes the replacement permit for Consent 2001.544, which includes the transfer of a small portion of the LIC Tarras Race water allocation for this property, plus the new supplementary permit (T3b).

117. The allocation associated with T3a (the primary allocation portion of water to be taken at site T3), is included in the draft LIC consent at Section 13.2.5. This is because LIC will remain the 'owner' of this permit until all of the new take sites in this consent are established and the races re dis-established. After that occurs LIC will transfer 'ownership' to the relevant landowners – in the case of T3a, 'ownership' will be transferred to the Smiths.

Hayman Family, Pukemara

118. The Haymans are planning to irrigate 400ha of land that is not currently irrigated and 52ha of this land will be irrigated using primary allocation.

119. Their area currently irrigated by LIC Tarras race water will become dryland.

Lindis Crossing Station

120. Lindis Crossing Station currently has 3 sources of water, LIC shares in the Tarras Race, bore water from the Lindis Alluvial Ribbon Aquifer and Clutha water.

121. Lindis Crossing Station currently have an application with the ORC to replace a permit to take and use groundwater from an existing bore at a rate of 90 L/sec and 880,000m^3 per year (Lindis Crossing Station was previously consented to take and use this water under 2004.382.V2, but now being processed as an application under RM14.164). This application was made prior to LCG's application, and is separate to LCG's application. The taking of Clutha water (groundwater connected to the Clutha) is authorised under consent RM13.451.02.

122. LCG are applying for the following on behalf of Lindis Crossing Station:

a. To increase the annual volume to be taken from their current bore. This bore is referred to as T4 in the application, in recognition that the shift in annual volume is water that Lindis Crossing Station previously received via the Tarras Race. As noted in the application, the rate of abstraction from the existing bore will not be increased, but LCG are seeking an additional volume of 729,000m3/year at the existing bore (referred to as Take T4 in the application.

b. A new supplementary permit of 56 L/sec at site close to T4. This is referred to as T4b, but no extra annual volume is sought for this supplementary permit – instead the annual volume taken will be *within* the annual volume sought for T4 of 729,000m^3.

123. This is because Lindis Crossing Station has storage, and so the supplementary water has been requested to be able to pump at a higher rate when the flows are higher. The total volume will not increase.

124. Lindis Crossing Station will be using their current water more efficiently to spread it further. As noted in Attachment 1, the farm has a current total irrigation area of 430 ha and this is proposed to increase this to 600ha, with 90 ha of this total area being irrigated by water from T4 and T4b, and the remainder being irrigated from its other sources. This 90 ha is currently irrigated with water from the Tarras Race.

Beau and Ann Trevathan, Lindisvale

125. The Trevathans will be converting to spray once their water source changes from the LIC Ardgour race to a bore/gallery set-up pumped to their farm.

126. The attitude of farmers to risk and their ability to invest in expensive spray infrastructure varies. The Ardgour race delivers water across the top of the Trevathan farm providing a gravity application option for the whole farm. The Trevethan's property is a small family unit. Being close to retirement it did not suit them to go into considerable debt on spray application systems when the minimum flow and water surety of the replacement permits were unknown.

127. The water allocation sought for this property is efficient.

Bruce and Linda Jolly, Ardgour Station

128. The existing and proposed breakdown of irrigation types on the property are shown in Attachment 1.

129. Ardgour Station will be able to fully complete its proposed conversions to spray irrigation once the storage is in place.

Cooke Family

130. The existing and proposed breakdown of irrigation types the abstraction from Take A7 are outlined in Attachment 1.

131. With regard to the Tomich Hill block, subdivision of this property has not occurred and no consent application has been lodged. The reference to subdivision was an indication of the Cooke's intention for this block in the future, and the continued need for water for this block. It is important to note that the Tomich Hill block is located outside of the Lindis catchment, and that LCG's application only seeks a consent to construct a bore (T5) on this property, but not a permit to take water from this bore. If drill testing shows that either the existing household bore or the bore at T5 can provide the necessary yield to supply this block, then LCG will support the Cookes in applying for a permit to take and use groundwater for the Tomich Hill block.

Rive and Reed Family: Cloudy Peak Pastoral Ltd

132. Cloudy Peak is irrigated with water from two sources:

i. 23 L/sec from Ardgour Race

ii. 28 L/sec from Consent 2007.497V1.

This property is not currently supplied with any water from the Beggs Stacpoole race.

133. The water from the existing 2 sources is used separately. Consent 2007.497V1 is not part of LCG's application as this consent doesn't expire until 2032. This consent and the use of this water do not have to be considered further, as the water is used separately from the Ardgour Race water. Consent 2007.497V1 was only referred to in the application as background information.

134. When the Ardgour Race closes, Cloudy Peak will lose its allocation of 23 L/sec from the race. On behalf of the Rive and Reed family (and LIC), LCG is applying to shift this allocation to a new take point referred to in the application as A2 (23 L/sec and 364,500m^3). This allocation is captured within the draft LIC consent in Section 13.2.5. This is because LIC will remain the 'owner' of this permit until all of the new take sites in this consent are established and the races re dis-established. After that occurs LIC will transfer 'ownership' to the relevant landowners – in the case of A2, 'ownership' will be transferred to Cloudy Peak Pastoral Ltd.

135. The Rive and Reed family are also seeking an additional permit to take water as supplementary allocation at a rate of 15 L/sec with a volume of 243,000m^3. This water has been referred to in the application as a transfer of a small portion of the Beggs Stacpoole race water to Cloudy Peak Pastoral Ltd. This permit is referred to as B2, but the water would be abstracted at the same site as A2.

136. This 'transfer' represents an agreement between the current Beggs Stacpoole permit holders and Cloudy Peak Pastoral Ltd and was originally intended to be a transfer of primary allocation water. However, in the drafting of the consent application it became clear that the primary allocation block that LCG was aiming for (1688 L/sec), would be exceeded if this water was transferred as primary allocation.

137. Accordingly, this portion of the Beggs Stacpoole water was applied to be 'transferred' as supplementary allocation. While this could have simply been sought as supplementary allocation with no reference to the Beggs Stacpoole race, the reference to it in the application is a reflection of the evolution of LCG's proposal to

reallocate water within the catchment as a result of the proposed closure of the large races.

Small Block owner on LIC Glenn Williams, Alistair Madill, Dry Creek enterprises, McElraes plus others.

138. As explained in the application the timeframe of 5 years is considered to be a tight timeframe for all the small block owners to complete the transition.

139. Some of the shareholders such as Glenn Williams are waiting now for the consent to be issued to start the works required. Glenn has developed plans to change from flood application to spray, and is keen to upgrade his block. However he will still need to select and fund a new bore set-up, irrigation infrastructure, measuring equipment, and possibly negotiate easements and power supplies.

140. Other small block owners are retired and mostly lease out their irrigated paddocks. These owners know their race supply will end and are starting to assess new bore sites and capacity of existing bores. However, these blocks owners do not want to begin spending money on these sites until they have certainty about their replacement allocation and the minimum flow.

141. All water is allocated on volume that is considered efficient for the area of land irrigated.

Tarras Farm Ltd

142. The total area of Tarras Farms Ltd is 338ha. A total area of 291 ha is irrigated on this property, with only 48ha of this being irrigated with water from Shepherds Creek. The remainder of the irrigation area is irrigated by water from the Clutha River.

143. The Shepherds Creek water is diverted to a dam and used on the property during the irrigation season. Some of the Clutha water is also diverted to the dam.

144. Fixed grid irrigation is a series of permanent sprinklers that remain established in a paddock. The sprinklers in a paddock are not all on at once but rather in turn. The depth of application can be adjusted on each sprinkler from a remote management system that is activated by solenoids on each sprinkler. It is an expensive system to install that offers a fine degree of irrigation application efficiency.

Robert Gibson, Malvern Downs

145. Robert Gibson has an allocation of 114 L/sec from the LIC Tarras Race and also has a permit to abstract water from the Clutha River. The water from the Clutha River is used to irrigate a separate block of land.

146. Irrigation on the 143 ha block beside SH8 near Tarras that is the subject of LCG's application currently consists of 45ha of border dyke irrigation (not the 70ha stated in the application). Mr Gibson proposes to convert all of this to spray irrigation and increase the total irrigated area to 70 ha.

147. This property and the proposed water source are outside of the Lindis catchment, and the water applied for is primary allocation water (Clutha catchment).

Yours sincerely

Sally Dicey
McKeague Consultancy on behalf of Lindis Catchment Group Inc

Encl:

Attachment 1:	Water Allocation and Use Existing and Proposed
Attachment 2:	Assessment of Annual Demand Based on Aqualinc (2017) For Proposed Irrigation Command Area
Attachment 3:	Basis for Residual Flows in Cluden and Waiwera Streams