Before a hearing held by Environment Southland

Under the Resource Management Act and the Proposed Southland Water and Land Plan

in the matter of

An application by Meridian Energy to excavate a channel in the bed of the Waiau Arm of Lake Manapouri/Lower Waiau River. Application AP 20233670.

Statement of Evidence of the Waiau Working Party.

1. The Waiau Working Party (WWP) made a submission to the application APP-20233670 from Meridian Energy Ltd for activities associated with construction of a new channel to enable a permanent diversion of part of the flow of the Waiau Arm, which is now part of Lake Manapouri, to enable more reliable flushing flows into the lower Waiau River to control excessive periphyton growth that occurs because Meridian controls the flow into that river as part of the Manapouri Power Scheme.

2. The WWP acknowledges Meridian's advice to us prior to application. We met with Meridian staff prior to notification where they explained the proposal. We acknowledge the method to create the channel mostly out of the water to reduce the discharge of dirty water but noted they were not interested in considering the provision of a gull nesting island which we suggested at the time. We also expressed concerns about the effect on the "lacustrine wetlands" at that time. We have also participated in two prehearing meetings to resolve the issues of disagreement and attempted to resolve some issues after those meetings. Many of the issues have been resolved but some remain.

3. The WWP was established in 1990 as a community consultative group by the Southland Regional Council (ES) and the operator of the Manapouri Power Scheme (now Meridian Energy Ltd) as a means of identifying, researching and resolving issues associated with the significant adverse effects of the

Manapouri Power Scheme (MPS) on the Lower Waiau River and wider catchment. The WWP has a long history of engagement with Meridian's consent applications in relation to the Waiau Catchment, as well as regulatory processes which directly concern the MPS.

4. Additionally, the WWP has a formally mandated role in reviewing consent compliance monitoring reports from Meridian Energy and providing recommendations to the consent authority (ES) on these reports and any alterations required to the existing monitoring and effects management regime.

5. The WWP understands that APP-20233670 is intended to improve flow conveyance and the reliability of flushing flows through the Manapōuri Lake Control (MLC), and is anticipated to result in better outcomes for river health in the Lower Waiau River. The WWP is generally supportive of this intent.

6. The purpose of the consent is to allow the construction of a new channel in the bed of the "Waiau Arm" of Lake Manapouri immediately upstream of the MLC. The Waiau Arm was the bed of the Lower Waiau River before it's water was diverted into Deep Cove for the MPS. The MLC controls the flow of the Lower Waiau River. The Lower Waiau River has a minimum flow regime as a condition of Meridian's main consents in this catchment.

7. Meridian is obliged to avoid, remedy or mitigate the adverse effects of its activities in the Waiau Catchment. The minimum flow regime delivers a limited range of flows to the Lower Waiau River throughout the year (12-16 cumecs depending on the time of year. However because these flows do not vary sufficiently enough to prevent excessive periphyton growth Meridian delivers flushing flows from time to time to try to reduce the adverse effects of the MPS on the river.

8. Members of the WWP believe a better solution to deliver more reliable flushing flows would be to lower the sill depth of the gate(s) of the MLC but Meridian believe that creating a new channel as described in this consent application is the best solution.

9. Flushing flows are flows with a mean of about 10 times the normal summer flow of 16 cumecs, delivered for a period of 48 hours. These have been scientifically shown over a period of 20 years to remove accumulated periphyton in the Lower Waiau so that natural character and river biota are protected as much as possible within the limits of the consented minimum flow regime. It is very important that these flushing flows are delivered when needed according to the current monitoring programme, so the WWP supports this consent as it is intended to help do this.

10. In summary the WWP generally supports the application, with some matters to be resolved, specifically:

    a) We support the recommendations in the AEE for the control and monitoring of suspended and deposited fine sediment as set out in the report by Dr Hoyle and now a proposed condition.
    b) We note the risk of increased phytoplankton blooms as set out in the report by Dr Kilroy and expect that conditions will be included to avoid phytoplankton blooms in the new channel and the existing channels. This will ideally involve real time monitoring of dissolved oxygen, and fluorometry complimented by regular validation monitoring at vulnerable times (low flow, high temperatures and high sunlight hours) complimented by a proactive flushing flow regime to prevent blooms occurring or remove any blooms. This matter is not resolved.
    c) We requested a condition requiring preconstruction inspection of areas that will be disturbed for freshwater fauna including but not limited to: mussel (kakahi) and relocation of these to suitable safe areas and Meridian has agreed to this. We are happy with the proposed conditions relating to this matter.
    d) We requested a condition requiring any fish, including eels, that are accidentally removed from the river during the works be returned to the water of the Waiau Arm. Meridian has agreed to this and we are happy with the proposed conditions relating to this matter.
    e) We requested a condition requiring any Buchanan's sedge plants that are in the working area are to be protected or relocated alongside a seed collection and propagation programme. Meridian has agreed to this and we are happy with the proposed conditions relating to this matter.
    f) We requested a condition to ensure that stonecrop, an exotic weed present on the site, is not spread from the site, that machinery and material is cleaned and checked before leaving the site. Meridian has agreed to this and we are happy with the proposed conditions relating to this matter.
    g) We support the recommendation in the AEE in relation to landscape that the final form of any channel created within the Waiau Arm shall be finished to avoid linear engineered forms and ensure sinuous organic shapes which reflect natural patterns subjected to natural elements and processes. We agree with this but believe the treatment of the existing distributary channels on the natural delta of the Mararoa River is not satisfactory as these wetlands need to be protected, including retaining existing natural connections to the main channel, and it is not clear that they will be. This matter is yet to be resolved.

h) We requested a condition that required any exposed islands to be made suitable for use by black billed gulls for nesting (with requirements such as elevation levels, final form, substrate etc). This matter is yet to be resolved.
i) We requested that the term of the consent align with the expiry of the main consents in 2031 that Meridian hold in relation to taking and discharging water for hydroelectricity power generation purposes. Particularly because we don't know what the conditions of the new consents will be and there may be opportunities to protect the environment further when this occurs. This matter is yet to be resolved.

Points in contention.

Potential for phytoplankton blooms in the new channel and the Waiau Arm more generally.

11. Dr Kilroy's report on phytoplankton (Appendix E of the Application) is very thorough and indicates there will be a greater risk of the development of blooms in the Lower Waiau River upstream of the MLC (referred to as the Waiau Arm) both during the project and following completion of the new channel.

12. The WWP considers the existing summer monitoring programme carried out under Appendix A of the main consent for the MPS for Waiau Arm water quality unsatisfactory, and requests that a consent condition be added requiring an update and enhancement of the water quality monitoring programme to the satisfaction of all stakeholders involved. This should include real-time monitoring of water quality in the Waiau Arm, with a requirement to provide flushing flows when exceedances occur both during the project and following completion.

13. The post-project plan is to rely on the current Waiau Arm water quality monitoring programme, which has already been identified by stakeholders as deficient in its provisions and unfit for present purposes, let alone the increased risk of phytoplankton blooms developing in this part of the Waiau Arm post-project.

14. Appendix E focuses mainly on velocity changes (reductions) in the existing (main and south) channels following the excavation of a new parallel channel, and reports that velocities will likely be reduced across a range of lake levels, leading to increasing risk of elevated chlorophyll a levels and associated phytoplankton blooms, with three to five times the number of days under high risk conditions expected.

15. Temperature effects, temperature stratification and expected shallower water in the three channels vs two channels are mentioned in Appendix E. These factors are expected to exacerbate the effects of reduced flow velocities and to increase even further the risk of elevated chlorophyll a levels and associated phytoplankton blooms.

16. Note that Table 4.1 on p 18 (Appendix E) indicates the increased risk of elevated chlorophyll a levels based on water velocities only - and it is on this basis that three to five times the number of days under high risk conditions are expected - without considering the possible exacerbating effects of increased water temperatures, increased light penetration and shallower depth of channels.

17. A summary of the effects assessment is given on p 19 of Appendix E, and this reiterates that "the chlorophyll a - velocity relationship suggests substantial increased risk of phytoplankton blooms over the risk in the existing channels. The predicted number of days per year under high risk of phytoplankton blooms in the post-excavation main and south channels was three to five times higher than that predicted for the existing main and south channels."

18. Appendix E states (p 19) "Modelled water depth (averaged across the channels) is less than 2.5m in the parallel channel option. The shallow depths ... could increase the risk to more than that suggested by water velocity alone, because of the risk of warmer temperatures at times. While the existing channels are even shallower [than <2.5m], the effect of temperature would enhance phytoplankton growth only when velocities are low: if phytoplankton is continuously washed downstream it cannot accumulate to form blooms"

19. Dr Kilroy then assesses the effect of the proposed enhanced flow releases as follows –(p21 Appendix E)
"Following excavation of the proposed parallel channel the increased risk of phytoplankton blooms in all three channels will be reduced by managed flow releases that are part of current flow management in the Lower Waiau River. Potentially useful flow releases are the larger flushing flows for periphyton management and the smaller recreational flow releases."

20. There appears to be no analysis of whether this actual number of flushing flows - which are infrequent, of intermittent timing (benthic periphyton removal flows), and for purposes other than removing phytoplankton (recreational flows to enable jet boat passage) - will be sufficient to ensure the frequency of "downstream washing" of phytoplankton necessary to avoid the build-up of blooms in the Waiau Arm.

21. The WWP requests a fully revised, updated, upgraded and appropriately tailored Waiau Arm water quality monitoring and mitigation plan be provided as a condition of consent incorporating the concerns and suggestions made in the above sections. The condition offered by Meridian is only for three years, and sets a trigger of 5mg/m^3 of chlorophyll a, whereas Dr Kilroy states that 2mg/m^3 is the level that marks the difference between A and B bands of the NPS-FM and is the baseline for this area. (p 11, Appendix E)

22. This would consist of a proactive programme of 'continuous downstream washing' designed to avoid the build-up of blooms both during and post channel construction, supported by an amended Waiau Arm monitoring regime which provides flushing flows if triggers are exceeded. There is also a need to ensure that sediment laden water from the Mararoa River does not get into the new channel. This water will contain nutrients such as phosphorus and nitrogen that could contribute to phytoplankton growth. A photo of the Mararoa River flowing at 55 cumecs with turbid water > 30 NTU taken at 1.53 pm on the 31st August is shown in Figure 1. At this time the flow over the MLC gates was 65 cumecs (according to the ES river flow monitoring web site) taking the dirty water downstream. With the new channel in place steps should be taken to ensure that this dirty water does not get up into the new channel. We suggest a condition to cater for this. At different lake levels and river flows the risk of this happening is variable. Real time turbidity monitoring is used to control the direction of the Mararoa River's turbid flows and we see no compelling reason to not use an equivalent approach in this situation.

Figure 1 The MLC and turbid water from the Mararoa being diverted into the Lower Waiau River. 31 August 2024.

23. The existing monitoring regime, and Meridian's offered programme should be amended to include:

- At least one additional water quality monitoring site be added to the current suite of monitoring sites, and this should be set up in the vicinity of the new and existing channels, and as close as possible to the Mararoa channel than is the case for the current monitoring sites. This site should be used to ensure this Mararoa water containing more than 30 FNU does not get into the arm as well as for phytoplankton monitoring.
- A monitoring programme which monitors phytoplankton in the new channel and two adjacent channels is a condition of this consent. Specifically, fortnightly samples shall be collected from each sampling location from 1 September to 31 May each year the over the term of the consent, and if the chlorophyll a concentration is more than 2mg/m3 at any site a flushing flow from Lake Manapouri shall be immediately provided (within 24 hours) sufficient to flush all the water in the Waiau Arm so that it is replaced with Lake Manapouri water. Monitoring is not required if mean flow velocities in the Waiau Arm have been more than 0.4m/sec towards the MLC in the previous 5 days, or the water temperature is less than 10 degrees C.
- The flow and temperature numbers are taken from Appendix E of the application and provide a margin of safety to ensure that monitoring occurs when the risk is increasing. This means that monitoring is not required all the time in the spring summer and autumn but does occur when the risk of blooms is higher.
- Meridian have argued that there is no need for this to occur for longer than three years as the monitoring they already do addresses the phytoplankton issue and is required under Appendix 1 of the 2010 consent. (This is available from Environment Southland and is entitled Water quality monitoring protocol for the Waiau Arm. Donna Sutherland NIWA September 2010) Meridian have promised that a revised programme will be presented to the WWP this year. The current programme is robust in terms of monitoring methodology but the response to declining water quality is inadequate as it only requires further discussion or monitoring so is not appropriate. It has three monitoring sites but none in the vicinity of the new channel. The requirement under the Appendix 1 is not as secure as a specific condition on a consent and therefore does not provide the same level of protection for the environment. We propose specific conditions for phytoplankton monitoring and these should be implemented regardless of any amendments to this protocol. We reiterate the need to provide the above monitoring requirements and trigger levels as a condition of this consent.

24. The WWP supports the recommendation on p 9 (Executive Summary) and p 60 of Appendix D of "ensuring the instream excavation phase of the Project does not commence until after mid-March to avoid effects on upstream migrating juvenile eels (elvers)." The WWP also supports the suggestion that any longfin eels removed during

excavation be returned to the Waiau Arm (p 8 (Executive Summary) and p60 / 61 of Appendix D).

Black Billed Gulls

25. Page 15 of the Landscape Effects Assessment (Appendix H) recommends that "The final form of any exposed islands created within the Waiau Arm shall be finished to avoid linear engineered forms and ensure sinuous organic shapes which reflect natural patterns subjected to natural elements and processes." We support this but also request a condition that requires any exposed islands be made suitable for use by black billed gulls for nesting (with requirements such as elevation levels, final form, substrate etc). Meridian has said they are not interested in providing nesting habitat for black billed gulls. They appear to rely on the evidence of Dr Leigh Bull who actually supports the provision of nesting habitat but says:

“With regards to exposed islands that are created within the Waiau Arm as part of the works, I am supportive of the recommendation in the MCLIP Landscape Assessment (Boffa Miskell Ltd, 2023a) that the final form of these be finished to avoid linear engineered forms and ensure sinuous organic shapes which reflect natural patterns subjected to natural elements and processes. This could be done in a manner that provides nesting habitat for species such as black-billed gulls, as requested in the Waiau Working Party and Waiau Habitat Trust submission points, and as such I support a consent condition requiring this. However, given the nature of this waterbody in terms of the controlled flows, these areas will be inundated as part of normal lake control operations, and for that reason, along with the overall Very Low level of effect of the project on black-billed gull, I do not consider it necessary that such islands be maintained as nesting habitat by the Applicant."

26. There is an existing island in this vicinity, built by Meridian in the past, which is used occasionally for nesting by black billed gulls so another would add to the amount of nesting habitat that is available for these birds in this area. Figure 1. When it has been used in the past it has been crowded with birds suggesting more space would be desirable. The new island should be built so that it is above the height of Lake Manapouri at normal flood events. This would ensure that flooding risk was low and most times any birds nesting there would be safe. Natural nesting sites of black billed gulls are on river beds and they are at risk of flooding. The island could be constructed out of excavated material from the new channel so is not a major departure from the proposed construction proposal.

27. Meridian may argue that providing a nesting island is out of scope because Dr Bull has said that the construction itself will have little effect on black billed gulls.

28. The new channel is part of a suite of works designed to discharge water more directly at the MLC gates. The diversion of the Mararoa took water away from its

natural channels reducing potential black billed gull nesting habitat so restoring some nesting habitat in this area is needed to mitigate this adverse effect.

29. The MPS has had a significant adverse effect on the macroinvertebrate population in the Lower Waiau River. When the river was diverted to West Arm and Deep Cove in the early 1970's the loss of uncountable mayflies, stoneflies, caddis flies and other river macroinvertebrates was not recorded formally, but Roger Sutton, past Senior Field Officer for the Southland Acclimatisation Society was there when the Waiau flow was stopped just below the confluence with the Mararoa River. He observed: "Witnessing the death of this great river was a devastating experience, reminiscent of being on a battlefield after a long battle. Death and destruction was everywhere, the stench of death and decay and great feeling of despondency. The masses of dead and dying invertebrate fauna clinging to every river bed stone and boulder exposed for the first time ever was an unforgettable experience." (Keeping Faith with Fin and Feather p115, 2002 – self-published – note Mr Sutton was a soldier in the Second World War).

30. Large stream macroinvertebrates such as the mayfly *Coloboriscus humeralis* are an important food item for black billed gulls as can be seen on the Upper Waiau where the water flow has not been reduced. Swift flows of water over large areas of the river bed provide necessary habitat for this large filter feeding mayfly species, such as at a lake outlet. Flows in the lower Waiau now provide much less suitable habitat for this species.

31. Our detailed argument for providing nesting habitat for black billed gulls and other river birds is presented in paras 32-40.

32. A PhD study has been completed on Black Billed Gulls in Southland, including the Waiau River, (McClellan R.K., The Ecology and Management of Southland's Black Billed Gulls, 2009) https://ourarchive.otago.ac.nz/esploro/outputs/doctoral/The-ecology-and-management-of-Southlands/9926481741601891. I have used the information in this study to support the comments in this evidence and recommend that this author be contacted if you want to obtain more information about the nesting requirements of these birds. Endemic black billed gulls (BBG) Tarapata, are the world's most threatened gull and are listed as either at risk – declining (DoC - website), and Bull (this application) nationally critical (O'Donnell 2016), critically endangered (Whitehead – NIWA memo) and endangered (McClellan 2009). The population in Southland, a stronghold in New Zealand, has declined by well over 50% in the last 30 years, and possibly as much as 83%. However, there are may be several thousand present in the Te Anau Basin and Lower Waiau River in the spring and summer. The birds do move from catchment to catchment from year to year and towards the coast in the winter. There are nesting locations in the Whitestone, Upukerora, and Mararoa River beds, which are used by BBG for nesting, but these are relatively small rivers and the gravel beaches in them are small and not usually islands. BBGs need gravel bars and river bed islands to nest on. The number of islands in the lower Waiau River has been

reduced by about 75% because of the MPS, although there are still many gravel bars there. These areas need to be free of woody or dense grassy vegetation. Ideally they should be islands so that predators such as wild cats and hedgehogs cannot get access to them. McClellan found that wild cats were the most significant predators, but ferrets and stoats were others. Predators such stoats can cross water and sometimes black backed gulls predate chicks however large islands are preferred by BBG as the predation pressure there is lower. There is also nesting habitat in the Upper Waiau River, especially at Balloon Loop where these birds nest from time to time. This site, and the other river sites are subject to flooding so providing secure island nesting sites where the flooding risk is low is an important method to ensure these birds continued survival is possible. (Figs. 2-3) The Department of Conservation publication "Management and research priorities for conserving biodiversity on New Zealand's braided rivers, O'Donnell et al 2016." provides evidence that islands in rivers are an important, along with weed and predator control, for the maintenance and protection of river nesting birds. https://braidedrivers.org/wp-content/uploads/ODonnell-et-al.-2016-Management-and-research-priorities-for-conserving-biodiversity-on-New-Zealands-braided-rivers.pdf

33. The existing island that is used intermittently by BBG for nesting is shown in Fig 2. It was constructed by Meridian in the past. This island has a maximum height of 179.4 masl. (ES LIDAR images) (In this evidence we use the term masl which means metres above sea level. The applicant uses RL meaning reduced level above a datum which is mean sea level so the terms are equivalent). The area at this elevation is quite small – about 200m^2. The report "03 Birds at MLC – NIWA" included in the application notes the height of the island is 180.5masl – the LIDAR measurement is likely to be more accurate. This report does say that "*maintaining and enhancing this island habitat will benefit freshwater birds.*" Nesting BBG are sometimes attacked by black backed gulls but these predators can be deterred by the adult BBGs mobbing them and driving them off. If the colony is small, black backed gull attacks are more likely. The existing island has only been used infrequently by the gulls and its small size may be a reason for this. McClellan's study discusses the complexity of possible reasons for using sites but large islands generally result in higher nesting success. Colonies with more than about 3000 birds were not seen to be attacked by black backed gulls. Nest density is 1.5/m^2 on average so an area of 2500m^2 (50mx50m) would be large enough for a colony of this size.

Figure 2. Constructed Island being used by BBG October 2021. (Blue outline shows approximate area where the new island could be provided.)

34. Where rivers are subject to flooding the bird's nests can be washed away so sites that are more secure from this are more beneficial for the survival of the species. An example of a flooded island and its effects on a breeding colony are shown below.

Figure 3. BBG forced to retreat to mid-stream logs and beach due to high flows in Upper Waiau in December 2019

Figure 4. High flows December 2019 at Balloon Loop on the Upper Waiau River – normally this area is an island as the trees that are above the water level show.

35. Another island should be constructed to provide nesting habitat in addition to the one shown in Fig. 2. This new island should: have a platform of at least 2500m$^{2;}$ and be higher than 180.5 masl. so that the risk of flooding during the nesting season is very low. This island should be constructed to mitigate the adverse effects of this activity on wildlife habitat in the Waiau. (180.5 masl is 1.90 m higher than the flood range (178.6 masl) of Lake Manapouri which Meridian is required to keep below most of the time to comply with the Lake Manapouri lake level guidelines.) The crowded nature of the existing island when it is used suggests that a larger area would be beneficial for the survival of BBG in this area. And at this height it will provide nesting and feeding habitat for other native and protected river birds such as banded dotterel, South Island Pied Oystercatcher, black fronted terns and pied stilts which live in this area.

36. This channel which the consent will authorise is, in part, necessary because of the previous works in the vicinity of the Manapouri Lake Control Structure (MLC) that have been undertaken to ensure flows can be delivered efficiently through the MLC for hydropower generation purposes, compliance with consent conditions and lake level guidelines, and to prevent dirty water flowing into the Waiau Arm. The most significant of these river works was to construct a channel in the lower reaches of the Mararoa River so that the natural distributary fan of the river was bypassed. This enabled water from the river to be discharged directly at the MLC. Prior to this the Mararoa River discharged to the Waiau via a wide fan of multiple channels that would

have been suitable for nesting of BBG and other river birds such as banded dotterels and oystercatchers. The Mararoa fan is now unsuitable for BBG nesting as it has become overgrown with long grasses and woody vegetation including crack willow trees. There are no gravel islands present now. Figure 5. (Google Earth image 2023)

Figure 5. Image showing the diversion channel and distributary fan of the Mararoa River where at least four channels were present with two large islands now overgrown with grasses and willows. Approximate area of land (>180.5masl) on the right bank of the proposed new channel is shown in blue.

37. Further information provided with this application includes two surveys completed by Teri McClelland (not Rachel McClellan) showing the importance of this area for BBG nesting in the past. Teri records that she got considerable assistance for this survey from Meridian at that time (2000 and 2001), including work to keep the nesting areas free of tall vegetation. The requirement for replacement nesting habitat is justified, given the status of BBG and other native river birds that live here and the general adverse effects on these birds that the MPS, including this latest proposal to modify it, has caused.

38. We believe that the construction of a suitable island could be integrated into the works needed to construct the channel. At low lake levels the area where the new

channel is proposed is dry (Fig. 6 of this submission), so this work could be done without discharging sediment into the Waiau River and be part of the construction works - Figures 5.1-3 of the application AEE. It appears that there will be high ground left on the inside (right bank) of the new channel as part of the works. Shown in blue in Fig 5. This land is about and above 180.5 masl (ES LIDAR maps – Figure 9). If this area was just left as is it could provide a suitable island in the future but the exact location and size of this area is not clear in the application. The Appendix H Landscape Effects Graphic Supplement shows what the area will look like at different lake levels after the works have been completed. On p 15 of this Appendix a simulated image is presented at lake level 179.5masl. There appears to be a small island present but its area is hard to determine. If this is not at least 2500m^2 an enlarged elevated area made of material that is excavated as part of the works could be used to make a relatively flat area that would be good for nesting and general river bird habitat. There are bunds proposed as part of the works and material from these could be used to assist with the building of a nesting island. All that is needed is to move a relatively small amount of material – less than about 8000 m^3 of material out of an estimated 225,000m^3 that will be excavated and relocated for the project. At high lake levels when large flows of water are discharged over the MLC (>600cumecs) flowing water could erode the island so compacting, smoothing and grading to a suitable slope would be required to avoid this. There is a low risk of this island interfering with the ability of Meridian to discharge flows to remove periphyton at low lake levels (the purpose of this consent application) because at these lake and river levels there is no water flowing over the proposed island or being diverted by the island as it is not in the new channel or other deeper areas of the river in this vicinity.

Figure 6 Area where the BBG nesting island could be constructed - the new channel is to be made in the foreground and to the left of the picture. The existing island is in the centre middle distance and the MLC to the right middle distance.

39. Another image of the proposed island, along with the existing island is shown generally below (Fig 7) (Image provided by Meridian in papers presented for the consent application).

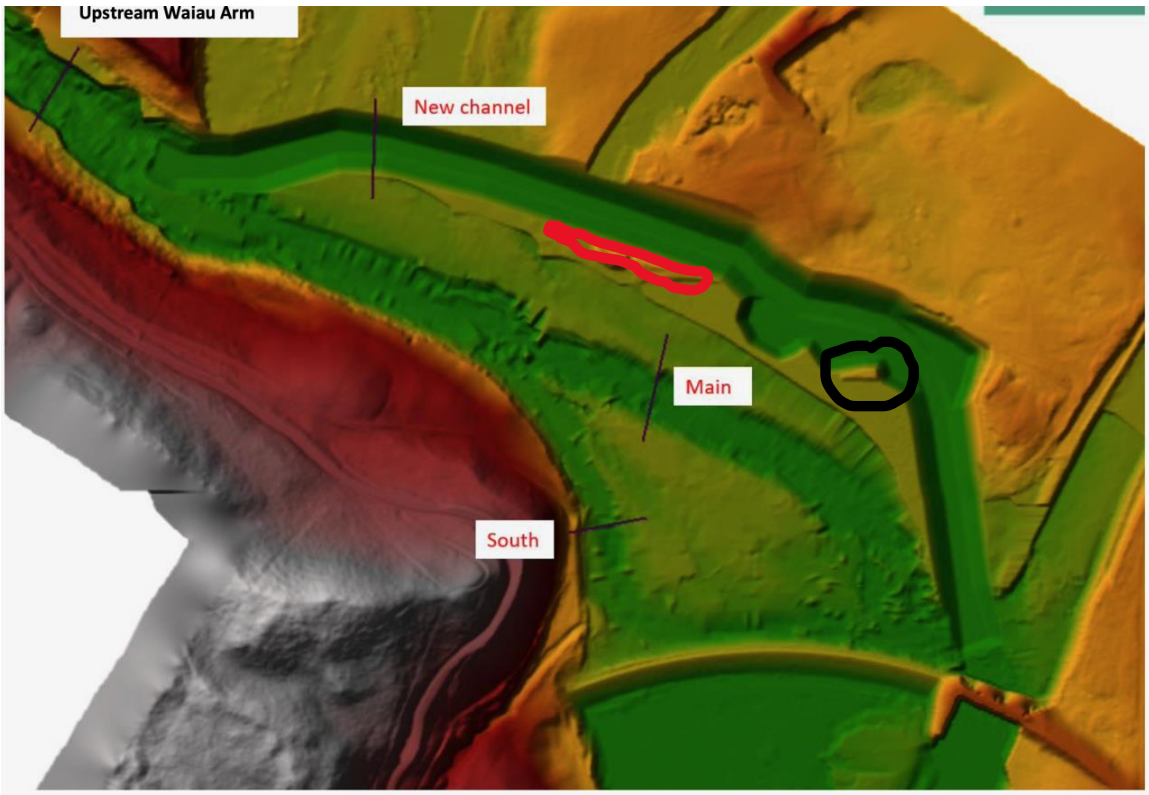

Figure 5: Three defined channels for the 'Parallel channel' excavation alternative, for which flow rates have been extracted from the model

Figure 7. Proposed general location of new bird nesting island shown in red, existing island circled in black. We are asking that an area of 2500m^2 is left above 180.5masl. Because of the importance of island nesting habitat for BBG and the perilous conservation status of the species and, that they travel to other parts of the Southland over their lives, this could contribute significantly to the survival of this species overall.

40. We also request that when gulls are nesting that Meridian undertake a pest control programme on the nearby shore, and that the island is kept clear of grasses and woody vegetation. Again there is not much work or expense involved in this - spraying the island with herbicide annually outside of the nesting season and contracting a local person to install and monitor pest traps for a month or so in the spring time when birds are nesting.

Conservation of previous distributary channels of the Lower Mararoa River.

41. As can be seen in Figure 5 above the old Mararoa River delta had 4 distributary channels. These are now wetlands that have a variable amount of water in them

depending on the height of the lake. (These are referred to as “lacustrine channels or wetlands” in the application. Section 4.6.2.2 of the AEE. p 23.) Figure 4.4 of the AEE, p 17 shows some of these at a lake level of about 177masl. In the NIWA report written by Jo Hoyle at Table D1 at p 15 three of these are listed as wetlands. Appendix F of the application reports on the value of these wetlands and the report generally concludes that they have moderate wetland values but are dismissive of the adverse effects of these works on them. Our knowledge of these wetlands over a period of time – since they were created - leads us to a different conclusion. Their value as long finned eel, common bully and trout habitat doesn’t appear to have been assessed. Table 4 of this appendix is clearly wrong. The memo from NIWA named “Birds at MLC” is a more reliable document. It appears the authors of Appendix F spent 15 hours over 5 days surveying the site. Annual variation of water levels, seasonal visitation by bird species, and presence of fish species at different lake levels and seasons does not appear to have been assessed. It is clear the “channels” are wetlands under the pSWLP definitions. Lacustrine means lake or relating to lake but these are relic riverine channels that have been converted into wetlands by the past activities of the applicant. (At Table 6.4 page 45 of the application the applicant does refer to them as lacustrine wetlands). The report from Damwatch describing the flow patterns in this area at different lake levels and river/lake flows partially shows the extent of these wetlands at a lake level of 178.6masl - for example Figure 7 at p105. This report also models different flow speeds at different lake levels suggesting that monitoring of turbidity in the new channel is necessary.

Figure 8 below shows these from the lookout on the Manapouri – Blackmount Road on 31 August at 1.54pm. The lake level was approximately 177.92 at this time according to Meridian’s website and water can be seen extending into these wetlands.

Figure 8. View of wetlands from Blackmount Manapouri Road with lake level at approximately 177.92masl.

These wetlands will be cut through as part of the works to create the new channel and for the haul road. This will reduce the size of these wetlands substantially. The AEE at 4.6.2.2 notes that these will be "partially affected" by construction of the new channel and the haul road. Looking at the Figures 5.1-5.3 of the AEE (p30-31) show the amount of loss although there is no scale on these images so it is difficult to tell exactly how much of the wetlands will be lost. They will be replaced with the new channel with flowing water and a haul road so their essential wetland characteristics will be lost over that area. Culverts are proposed to link the channel to these wetlands after the works have been completed but to be consistent with the need to leave the site in a natural state after the works, and to restore the wetlands, culverts should be avoided so the haul road needs to be lowered to the existing level (177masl – ES LIDAR maps) to allow natural passage of water between these wetlands and the main channel. There are national guidelines for fish passage https://environment.govt.nz/assets/publications/freshwater-policy/Fish-Passage-Factsheet-Updated_Sep-22-FINAL.pdf Small culverts are to avoided as much as possible. In this case having no culvert but a natural river/lake bed that the water flows over without any falls or other obstacles is the best option. Further, the Applicant should enlarge the wetlands by excavating an area at the upstream ends of these wetlands to a depth of 177masl of the same size that will be lost. A screenshot from

the ES LIDAR images is shown below to show the elevations in this area. The bed level of the wetlands lies between 177 and 178masl so extending the area of land to 177masl will restore the area of wetland that will be lost in these works. Figure 9 below.

Figure 9. ES LIDAR image of land in the vicinity of the proposed new channel.

In addition the crack willows in this area should be sprayed and killed by the applicant otherwise these trees will ultimately grow over the wetlands and destroy them. This can be justified as the applicant will be modifying these wetlands so this is mitigation to reduce the adverse effect of this activity. Appendix H at p 11 recommends "*disturbed areas, including resultant islands should be maintained to ensure these are not subject to spread of pest species including crack willow*". There are 4 of these wetlands (old river channels) that are subject to flooding and at lake levels of 178masl there is a total of about 2.5ha of their area covered in water. (Google Earth Pro measurement tool and ES LIDAR images) If the lake is less than 177masl the connection between the wetlands and the main channel is lost but they can retain their water for extended periods making them valuable habitats. Some water seeps into some of them from the adjacent terrace too, helping to maintain water levels. Culverts will always be a constriction to natural flows in and out, potentially limiting fish passage compared to a natural channel, and they are an unnatural feature not complying with the need to restore the area to have a natural appearance as recommended by Meridian's consultants. As these are wetlands the proposed Southland Water and Land Plan requires that they be protected so providing a culvert to keep them connected to the

main channel may not be compliant with the relevant rule in the plan nor the objectives and policies of that plan. Modification of wetlands is a non-complying activity in the pSWLP so their restoration to their previous state after these works in essential. Note if the haul road is left as an elevated feature on the area this will be contrary to the need to restore the area to a state without “linear engineered forms”. However if the panel is persuaded that culverts are acceptable in this case these must be large, at least 2m in diameter and buried 1 m into the bed of the lake/wetland outlet so that fish passage and water exchange is as natural as possible in this situation. But with the haul road lowered and the wetlands extended there is an opportunity for the applicant to enhance these features in the process of mitigating the adverse effect of this activity so that would be a benefit to the environment and not too difficult to do.

42. The Applicant has identified wetlands on Figure 5.1 of the AEE but not included the larger wetlands referred to above that will be directly impacted by the construction activities. At para 7.6.2.2 the application does recognise these as wetlands and proposes methods to mitigate the adverse effects of the channel construction of these. However we believe the Applicants proposals are not sufficient. These wetlands have not been surveyed for fish, macroinvertebrates or macrophytes at different times of the year and different water levels. See NIWA report by Mike Hickford showing where the fish survey occurred. Figure 1 of his report. At this time these wetlands were not connected to the main channel. I have explored these areas in the past when they had water in them and can confirm they are habitats for trout, lentic macroinvertbrates and a range of macrophytes such as *Potomageton* species at least. At low lake levels they can become isolated from the main channel but when the lake is above about 177.5 masl water can flow into these wetlands. This is in the lower end of the main range of Lake Manapouri so for much of the time they are connected and are valuable habitats. They fit the definition of wetlands in the pSWLP and are likely to be habitats for long finned eels and common bullies as well. These fish were found nearby in the Applicant’s survey of the area for fish species. These wetlands are productive with fish species entering them when they have water in them but leaving them when they dry out. It is important that the outlet/inlet is as natural as possible to allow this. The Applicant has attempted to show that these wetlands are not worth protecting but given the loss of wetlands in New Zealand and Southland especially - and those lost because of the MPS in particular, any opportunity to protect and enhance existing ones should be taken. Stats NZ reports “Southland recorded the biggest loss of freshwater wetlands, contributing to almost half (46 percent) of the total loss of freshwater wetlands in New Zealand between 1996 and 2018 with a reduction of 2,665 hectares.”

https://www.stats.govt.nz/indicators/wetland-area

Consent Duration and ongoing maintenance.

43. A consent duration of 35 years has been requested by the applicant. The WWP considers it appropriate to align the consent duration with that of the rest of the MPS operational consents, which expire in 2031.

44. Aligning the expiry dates will support a holistic and integrated approach to managing the effects associated with the MPS as a whole, and specifically the flow regime of the Lower Waiau River into the future. The WWP considers that such an approach is critically important in the journey towards a state of Hauora for the Lower Waiau River.

45. At the second pre hearing meeting Te Ao Marama advised that they are unlikely to support a term greater than 25 years (and possibly shorter) and suggested a review of this consent when the main operating consents for the MPS expire in 2031. We support this.

46.We also note that the applicant has offered to have included in the consent a 5 year review proposal. With the following amendment, the WWP is comfortable that that 2031 review, suggested by Te Ao Marama, would be possible. We suggest a modification to Meridian's proposed condition 21 to enable such a review. This is included at para 53 with our suggested modified and new conditions.

47. We understand that Meridian's argument for the maximum available term hinges on its contention that there are no ongoing effects associated with the activity once the channel is completed. However, we note that Meridian proposes to be allowed as part of this consent to carry out maintenance activities to prevent build-up of sediment in the new channel. It is not expected that this will be needed very often – approximately every 5-10 years. The conditions proposed will still result in turbid water in the Waiau downstream of the weir for several kilometres while the work is being undertaken, assuming an outflow from Lake Manapouri coincides with this work, which it should to avoid suspended sediment travelling into the Waiau Arm of Lake Manapouri.

48. Ideally this work should be done in the winter to avoid adverse effects on users of the river, mainly anglers, but also others expecting a clear water river. We request that this work only be allowed from May to August inclusive, unless there was a need to do the work in case of an emergency, such as a very large erosion event as a result of a large flood. In this case the layering of the outside bend of the channel with large angular rock may be needed. This time restriction will also avoid disturbing wildlife in the area during nesting periods.

49. After reading the evidence of Dr Burrell we support a monitoring condition that is intended to ensure that the new channel actually does provide the benefits that Meridian hope to achieve. That is that periphyton biomass is kept low throughout the length of the lower Waiau River.

Relevant Objectives and Policies of the proposed Southland Water and Land Plan.

50. We expect that the commissioners will have their attention drawn to the objectives and policies of the pSWLP. We would like you to pay particular attention to the

following. (This is not a full list of all Objectives and Policies that are relevant to this application but are those that relate to the matters that we raise.)

Objective 13 relating to the use of land and soils,

Objective 14, relating to indigenous biodiversity protection,

Objective 17, relating to the preservation of the natural character of wetlands, rivers and lakes,

Objective 19 in relation to fish passage (the proposal to instal culverts)

Policy A4 of the NPS for FW relating to water quality – discharge of sediment,

Policy 13 relating to discharges to water – discharge of sediment,

Policy 15 relating to discharges to water – discharge of sediment,

Policy 26 – relating to renewable energy, and effects on the Waiau River, especially Policy 26 (2)

Policy 26A relating to the maintenance of nationally significant infrastructure.

Policy 28 – relating to activities in river beds,

Policy 29A – relating to values of rivers,

Policy 29 – relating to the extraction of gravel

Policy 30 – relating to drainage maintenance – usually applied to drainage maintenance on farms but arguably relevant here as this channel is designed to enhance water flows from Lake Manapouri to the lower Waiau River.

Policy 32 – relating to the protection of significant indigenous fauna and habitat,

Policy 33 and 33A – relating to the protection of wetlands,

Policy 34 - relating to the restoration of existing wetlands,

Policy 40 – relating to the term of resource consents – particularly subsections 1 and 5 of this policy,

We note that the Applicant has agreed that consents required to permit these works are to be bundled as non-complying so it is necessary that they comply with the objectives and policies of the pSLWP.

51. We also ask the panel to consider this application in the context of the Waiau River ecosystem and its current state, as described in the ES Catchment context, challenges and values for the Waiau https://maps.es.govt.nz/apps/catchment-context/Catchment_Context_Waiau.pdf

52. The channel should improve the ability of Meridian to discharge flows to reduce excessive periphyton in the lower Waiau and so improve the river ecosystem to some extent but by going a little bit further they could make significant improvements to the water quality of the Waiau Arm and wildlife habitats in the vicinity of the works .

53. Meridian has provided a list of conditions to the consent. We have adjusted these in a way that we believe would meet our concerns. We support many of the conditions and have not included those here but only those we believe should be adjusted.

Requested new/modified conditions. *Our additions are underlined and italicised*

Maintenance Activities

Discharge condition 14. Add; *The maintenance activities shall only occur in the months of May-August inclusive, in any year, unless in the case of an emergency, when remedial works may be undertaken with the approval of the consent authority.*

General Conditions

Condition 9 Installation of culverts in lacustrine channels/wetlands

Delete this clause as the restoration of these wetlands is dealt with in Condition 10.

Condition 10 Wetland Remediation
In addition to the existing add. *The lacustrine wetlands (channels of the Mararoa River that existed before the Mararoa River was diverted to discharge directly at the Manapouri Lake Control Structure) shall be restored to the state they were in prior to the commencement of the works, including the removal of the haul road so that water may flow freely between these wetlands and the new channel as it did previously. An area equivalent to the area removed from these wetlands by the works shall be replaced at the upstream end of each of the wetlands by excavating the required area down to an level of 177masl. The Applicant shall kill the existing crack willows on Meridian land as shown Figure 4.2 of the AEE by spraying with a suitable herbicide - dead trees may be left to decay naturally. Any regrowth shall be killed also.*

Note while we believe removal of the haul road is the best option from an ecological viewpoint if culverts are accepted these must not prevent fish passage or the natural flow of water between the new channel and the wetlands. They must be at least 2m in diameter and buried into the bed of the lake by 1m. A maintenance clause must be included to ensure they function as designed throughout the life of the consent.

Condition 11 of Schedule 1 – General Conditions Water Quality Monitoring Programme.

a. The Consent Holder will prepare a water quality monitoring programme (WQMP) for the detection of phytoplankton blooms in the parallel channel and existing channels (adjacent to the parallel channel). This WQMP shall be prepared by a suitably qualified

person and be to the satisfaction of the consent authority prior to its implementation. Sampling methods shall be consistent with the existing methods for monitoring water quality in the Waiau Arm under Appendix 1 of the Manapouri Tailrace Amended Discharge consent entitled Water quality monitoring protocol for the Waiau Arm. Donna Sutherland NIWA September 2010).

b. *Between 1 September and 1 May, when the water temperature in the arm is more than 10 degrees Celsius and the mean flow in the Waiau Arm has been less than 0.04m/sec towards the MLC for the previous 5 days, the WQMP will require measurement of water temperature, dissolved oxygen, water clarity, pH and chlorophyll a at three Representative Sites. Notwithstanding conditions 11 c-e, further measurements are required every two weeks while these temperature and flow conditions continue.*

c. *For the purposes of clause (b), 'Representative Sites' means one site in the parallel channel and two sites in the existing channels. The location of the Representative Sites shall be agreed in writing with the Consent Authority prior to the implementation of the WQMP.*

d. *Within three working days of receiving notice that chlorophyll a has been detected in a sample at or above 2 mg/m^3, the Consent Holder will release a flow of 35–45 cumecs for 24 hours across the Manapōuri Lake Control Structure into the Lower Waiau River, after which the monitoring programme shall resume.*

e. *If two or more chlorophyll a readings are detected at levels at or above 2 mg/m^3, a review (in the form of a written report) will be undertaken by a Suitably Qualified Person to consider whether the flow release management response specified in clause [d] needs to be amended. The Consent Holder will provide the report to the Consent Authority within 6 months of the last fortnightly measurement in the WQMP being taken.*

f. *A turbidity monitoring site shall be established in the new channel as close as is reasonably practical to the Mararoa River channel to ensure turbid water from the Mararoa does not enter the new channel or the Waiau Arm. If turbid water > 30 NTU is detected in the new channel or the Waiau Arm the consent holder shall immediately increase the flow of the Waiau Arm to ensure this is flushed out and report any such incident to the Consent Authority.*

Condition 14 Landscape and Rehabilitation

An additional condition is required to provide for nesting habitat for river birds. After the existing sentence add: *An area of excavated material (gravel, sand and boulders) of no less than 2500m^2 that is above 180.5 metres above sea level and contoured to the surrounding landscape is provided on the right bank of the new channel to form an*

island. The consent holder shall maintain the island free of all live vegetation (trees, shrubs and grasses), and when black billed gulls are nesting there prepare and implement a predator control programme to the satisfaction of the consent authority.

Condition 21. Review.

21. The Consent Authority may, in accordance with Section s 128 and 129 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions of these resource consents at five year intervals, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or within 24 months of consents for the operation of the Manapouri Power Scheme (being replacement consents for those due to expire in 2031) being issued and any appeals decided , for the purposes of:

a) Determining whether the conditions of these resource consents are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the resource consents, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of these resource consents;

b) Ensuring the conditions of these resource consents are consistent with any National Environmental Standards, Regulations, relevant plans and/or the Environment Southland Regional Policy Statement;

c) Requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of these resource consents;

d) Aligning the conditions of this consent with the conditions of consents for the operation of the Manapouri Power Scheme.

Second Pre-hearing meeting

54. A note on the report of the second pre hearing meeting. We were asked for feedback on the report and made the following response on the 30th July. We note that not all of these points were recorded in the record of the meeting and want to draw the panel's attention to this. The following is our response.

Response to record of prehearing meeting for Meridian consent APP 20233670 held by Teams meeting on Wednesday 24 July 2024.

The WWP (Waiau Group) agrees with the record except for the following points.

Generally, matters that the WWP has raised are matters of concern to all the Waiau Group (WWP, Waiau Wildlife and Habitat Enhancement Trust, and the Waiau Rivercare Group) who all made submissions so WWP should be replaced with Waiau Group where it occurs in the report.

Apologies - where the record states "Roger Hodson on behalf of Maurice Rodway…" this can be removed. Roger is representing the WWP and the Waiau Fisheries and Wildlife Habitat Enhancement Trust. Also, a typo in the line Claire Jordan – Waiau Fisheries and Wildlife etc. (not a comma there)

Para 29-30. It was TAMI that suggested a review clause that the Waiau Group supported as recorded at para 25. Just need to make these consistent. Note at para 29 the word "shorted" should be "shorter".

Para 32 should refer to nesting habitat not just habitat. We request that this para be replaced with:

Waiau Group - Bird Island in the existing channel has been utilized by Black-billed Gulls for nesting successfully in the past. The Waiau Group would like to see a new island built to provide additional Black-billed Gull nesting habitat. As outlined in the pre-circulated WWP memo referred to at paragraph 3 of this report, building of such an island is supported by Leigh Bull (Ecologist for Meridian), who stated that:

"With regards to exposed islands that are created within the Waiau Arm as part of the works, I am supportive of the recommendation in the MCLIP Landscape Assessment (Boffa Miskell Ltd, 2023a) that the final form of these be finished to avoid linear engineered forms and ensure sinuous organic shapes which reflect natural patterns subjected to natural elements and processes. This could be done in a manner that provides nesting habitat for species such as black-billed gulls, as requested in the Waiau Working Party and Waiau Habitat Trust submission points, and as such I support a consent condition requiring this. However, given the nature of this waterbody in terms of the controlled flows, these areas will be inundated as part of normal lake control operations, and for that reason, along with the overall Very Low level of effect of the project on black- billed gull, I do not consider it necessary that such islands be maintained as nesting habitat by the Applicant."

The word Waiau is misspelt at para 25, last sentence.

Waiau Group did ask about the design of the culverts to link the lagoons/wetlands that were distributary channels of the Mararoa River before it was diverted by Meridian to discharge directly at the MLC structure to the main channel. This relates to the final form of the channel and how it links to the old channels of the Mararoa. Meridian has agreed that this should be natural as recommended by Boffa Miskall. This was not

recorded and there was limited discussion about this issue. We would appreciate that this issue could be recorded. It is an unresolved issue at this stage. Waiau Group noted that culverts can be barrier to fish passage if not designed correctly and that natural channels are preferred.

Para 70 WPP should be WWP.

We are happy the record captures the discussion about turbidity and how this might be controlled and note that this has not yet been agreed. The Waiau Group has concerns about how the control of turbidity from the Mararoa River flowing into the Waiau Arm with the new channel will be managed.

The monitoring programme to ensure phytoplankton blooms do not occur in the new channel and the Waiau arm relies on the implementation of a programme that sits outside of this consent application. It is necessary that this programme is in place and agreed by the parties for the Waiau Groups to agree to the proposed conditions in this consent otherwise the monitoring of the phytoplankton in the new channel may not be adequate.

Letter of support.

55. We include the text of a letter of support for our submission from the Royal Forest and Bird Society. This was also sent to Environment Southland. Appendix 1.

Appendix 1

SUPPORT LETTER FOR THE WAIAU WORKING PARTY (WWP) SUBMISSION AND EVIDENCE FOR APP-20233670 - MERIDIAN ENERGY LTD

1) The Royal Forest & Bird Protection Society Inc. of New Zealand (Forest & Bird) is Aotearoa New Zealand's leading independent conservation organisation. Forest & Bird has played an important role in protecting and preserving New Zealand's environment and native species for a century.
Forest & Bird is independently funded by private subscription, donations, and bequests.
2) Forest & Bird has for many years had a strong interest and involvement in protecting and restoring nature on land, in freshwater and in the ocean, throughout the country including in the Waitaki area. Our Forest & Bird strategic objectives are as follows:

- **Climate Centred**: Ensuring our country does everything we can to keep the climate safe for all life on Earth. The impact of climate change will be at the centre of everything we do.
- **Economy that Supports Nature**: A Community that recognises that the long-term economy is dependent on a healthy environment for nature's intrinsic and lifegiving values.
- **Vibrant Landscapes**: Stable, healthy ecosystems full of native animals and plants.
- **Energised Water, Rivers and Wetlands**: Rivers, streams and freshwater that run clean, healthy and are teeming with life.
- **Oceans Alive:** Protected and preserved marine life and ecosystems.

3) Forest & Bird have an active volunteer branch in Southland, part of a network of 45 volunteer led branches nationally, whose multigenerational members and supporters play an important and active role in protecting and restoring the region's native species and habitats in their respective districts. Within Forest & Bird there is a wealth of knowledge and expertise on protecting and restoring Aotearoa New Zealand's native ecosystems and species. Forest & Bird also have regional Kiwi Conservation Clubs for tamariki, and Youth branches for rangatahi across the country.
4) APP-20233670 is for the construction of a new channel to enable a permanent diversion of part of the flow of the Waiau Arm and the associated removal of bed material and gravels, together with any maintenance and ancillary activities. The project is intended to improve flow conveyance and reliability through the Manapōuri Lake Control structure, and so result in better outcomes for river health in the Lower Waiau River.
5) Forest & Bird support the submission and evidence provided by the Waiau Working Party (WWP) in full.
Kā Mihinui
Chelsea McGaw
Regional Conservation Manager (RCM) – Otago and Southland
Royal Forest and Bird Protection Society of New Zealand Incorporated.

Appendix 2 Author qualifications and responsibility.

The main author of this document is Maurice Rodway. Dr Sue Bennett and Claire Jordan reviewed it and made suggestions for improvement. Any errors or omissions are the responsibility of the main author.

Our qualifications:

Claire Jordan

I hold a Master of Resource and Environmental Planning with 1st class honours from Massey University, and a Bachelor of Science with Honours (1st class) from the University of Canterbury majoring in chemistry (undergraduate) and environmental science (honours).

I have 11 years' experience working as a policy analyst/planner and environmental scientist, including roles with the Ministry for the Environment, the Environmental Protection Authority, Tonkin & Taylor Ltd and Environment Southland (ES). I am currently contracting under my own name, predominantly as a planner for the Waiau Fisheries and Wildlife Habitat Enhancement Trust (Waiau Habitat Trust).

Sue Bennett

I hold a BSc (Hons) in Horticulture and a PhD in Plant Science, both from the university of Bath, UK and since 1992 have enjoyed a career as a self-employed contract botanist here in New Zealand.

I have been a member of the Waiau Working Party since 1992, served on the Southland Conservation Board from 1993 to 1999 and have been a member of the Guardians of Lakes Manapouri, Monowai and Te Anau from 1999 to 2013 and from 2017 to the present.

Maurice Rodway

1. I was the Manager of Fish and Game New Zealand, Southland Region since the inception of the Council in 1990 and prior to that as the manager of the Southland Acclimatisation Society, the Fish and Game Council's statutory predecessor, since 1984. I retired from that position in January 2016. My work for Fish and Game involved the management of freshwater fish and wildlife and their habitats.

2. I hold the qualifications of B.Sc., and M.Sc. (Hons) in Zoology, and Advanced Sustainable Nutrient Management Certificate from Massey University, New Zealand. The Zoology degree thesis was a study of trout in the Rangitikei River.

3. I was an elected member of the Southland Regional Council (Environment Southland) from 2007-2019, and am currently a member, being re-elected in 2022.

4. I am a certified Commissioner for the purposes of the RMA.

5. As an elected councillor on the Southland Regional Council, I have held the position of Chairman of the Consents Committee and the Organisational Performance and Audit Committee. I am chairman of the Finance and Performance Committee and the Climate Change Subcommittee. I have chaired consents hearings and have been a member of the hearings panel for the Southland Water and Land Plan, Southland Regional Policy statement, Fiordland Pathways Plan (chair) and revision of the Southland Air Plan.

6. I was a member of the Southland Conservation Board from 2016-2019.

7. I am the chairman of the Waiau Working Party and have been involved in the monitoring and management of the Waiau River in relation to the effects of the applicant's consent on the Waiau River since the WWP was formed in the early 1990's. I was instrumental in setting up the new minimum flow regime in the lower Waiau River along with Mark France who was working for Meridian's predecessor at that time. In particular I have been involved in monitoring of the river for periphyton and working with Cathy Kilroy in the development of limits for periphyton while I was working for Fish and Game. I have spent many hours on and in the river, drift diving to count trout, kayaking and boating on the Upper Waiau and the Lower Waiau rivers and observing the changes that have occurred from year to year over time from 1984 till the present. I don't believe anyone else involved in this application has a similar level of experience and scientific knowledge of this river, although I recognise that Cathy Kilroy has been involved over a similar length of time and she has an expert knowledge of periphyton in this river. Dr. Rachel McLellan who undertook a PhD study of BBG on the Waiau River, is the person with the most expert knowledge of gulls and other river birds in the Waiau River.

8. My publications and conference presentations are:

a. Master of Science thesis – The Movement of Trout in the Rangitikei River, New Zealand. 1985.

b. Conservation and Recreation - Rodway, M.A. and Davis S.F. Paper presented to Institution of Professional Engineers New Zealand and Royal Society Water Conference 1988 Water in Society, Policy and Practise.

c. Assistance with the preparation of the New Zealand Stream Periphyton Monitoring Manual by B.J. F. Biggs and Cathy Kilroy. Published by the Ministry for the Environment. 2000.

d. Assistance with the preparation of the New Zealand Periphyton Guideline, Detecting, Monitoring and Managing Enrichment of Streams by B.J.F Biggs. Published by the Ministry for the Environment. 2000.

e. Angler use surveys, trout abundance changes and trout use of a new fish pass on the Waiau River (Southland) 1996-2000. A paper presented to a joint conference of New Zealand Hydrological Society, Meteorological Society, and New Zealand Limnological Society. Christchurch 2000.

f. Changes to the condition of the waterways in New Zealand – a Fish and Game perspective. A paper presented to Just Add Water – a joint conference of the New Zealand Hydrological Society and New Zealand Limnological Society. 2001.

g. Riparian management – benefits to water quality. A paper presented to the South Island Dairy Event. Invercargill. 2002.

h. Determination of Southland, New Zealand, game bird hunting season opening weekend bag from the abundance of class 5-6 duckling broods in the previous spring. Co-author of paper presented to the 3rd International Wildlife Management Conference, Christchurch 2003.

i. Sport fishery Management. Neil Deans, Martin Unwin and Maurice Rodway. A chapter in “Freshwaters of New Zealand” edited by Jon Harding, Paul Mosely, Charles Pearson and Brian Sorrell for the New Zealand Hydrological Society and the New Zealand Limnological Society. 2004.

j. Investigating the effects of flushing flows on didymo blooms in the lower Waiau River, Southland. A joint presentation with Cathy Kilroy NIWA, to the NZ Freshwater Sciences Society Conference November 2009.

k. Long term management of an invasive alga in a controlled river. Rodway, M., Jarvie, B., Sutherland, S. And C Kilroy 2011. A poster presented to the American Fisheries Society Conference, Seattle, USA. Sept 4-8 2011.

l. Trout abundance changes in Southland as determined by drift diving, 1990-2014. Rodway, M. and C. Stewart. 2015. Presentation to the New Zealand Freshwater Sciences Society Conference, Upper Hutt November 2015