GENESIS ENERGY LIMITED

TEKAPO POWER SCHEME

Fast-track Application for Resource Consents and Assessment of Environmental Effects

April 2025

[This page has deliberately been left blank]

Ko tā te Waitaki mahi he manaaki i te motu

The generosity of the Waitaki provides for the nation

TABLE OF CONTENTS

Executive Summary i

1. Introduction 1

1.1 Background and Overview 1
1.2 The Purpose of the Fast-Track Approvals Act 4
1.3 Lake Takapō and Takapō River 5
1.4 Genesis Energy 6
1.5 Approach to these Resource Consent Applications 9
1.6 Resource Consents Required 43
1.7 Report Structure 47
1.8 Supporting Technical Assessments 47

2. Tekapo Power Scheme Overview 49

2.1 Introduction 49
2.2 History of the Tekapo Power Scheme 49
2.3 Takapō 56
2.4 Takapō River and Lake George Scott 58
2.5 Tekapo A Power Station Intake 62
2.6 Tekapo A Power Station 63
2.7 Tekapo Canal 64
2.8 Tekapo B Power Station 66
2.9 Role of the Tekapo Power Scheme in New Zealand's Electricity Supply System 67
2.10 Existing Resource Consents 71
2.11 Mitigation / Compensation Agreements 72
2.12 Other Agreements 73
2.13 Future Operating Regime – Peak Inflows 74

3. Resource Consent Requirements 76

3.1 Overview 76
3.2 Canterbury Regional Council Jurisdiction 76
3.3 Mackenzie District Council Jurisdiction 84
3.4 Overall Activity Status Summary of Consent Requirements 85
3.5 Consent Duration 85

4. Environmental Setting 91

4.1 Introduction 91
4.2 Cultural Setting 91
4.3 General Setting 92
4.4 Surrounding Landuses and Demographics 94
4.5 Zoning and Planning Framework 95
4.6 Climate 99
4.7 Takapō 99
4.8 Tekapo Canal 110
4.9 Takapō River 112

4.10 Lake Pūkaki 121
4.11 Lake Benmore 122
4.12 Landscape and Visual Amenity 122
4.13 Geology and Groundwater 124
4.14 Terrestrial Ecology 126
4.15 Recreation and Tourism Values 134
4.16 Other Water Users 137

5. Assessment of Environmental Effects 138

5.1 Introduction 138
5.2 Decarbonisation and Economic Effects 138
5.3 Cultural 141
5.4 Takapō 146
5.5 Tekapo Canal 157
5.6 Takapō River 157
5.7 Lake Pūkaki 161
5.8 Lake Benmore 162
5.9 Fish Passage 163
5.10 Groundwater Effects 164
5.11 Terrestrial Ecology Effects 164
5.12 Landscape and Visual Amenity Effects 173
5.13 Flood Management 173
5.14 Recreation Effects 174
5.15 Conclusion 175

6. Operating Parameters, Proposed Mitigation, Management Methods and Monitoring 176

6.1 Introduction 176
6.2 Proposed Operating Parameters 176
6.3 Biodiversity Enhancement 177
6.4 Cultural Mitigation 189
6.5 Fishery Enhancement 190
6.6 Amenity 191
6.7 Whitewater Recreation 192
6.8 Flood and Spill Management 203
6.9 Dam Safety 205
6.10 Ongoing Monitoring of Operations and Effects 206
6.11 Canterbury Regional Council Consent Condition Comments 207

7. Resource Management Act Assessment 213

7.1 RMA Requirements for a Consent Application 213
7.2 RMA Section 104 Assessment 213
7.3 Part 2 Matters 256
7.4 Section 105 of the RMA – Matters Relevant To Discharge Applications 261
7.5 Section 107 of the RMA – Restriction to Grant Certain Discharge Permits 262
7.6 Section 124B of the RMA – Applications by Existing Holders of Resource Consents 263

8. Consultation and Engagement ____ 264

8.1 Introduction and Genesis Approach 264
8.2 Manawhenua 265
8.3 Department of Conservation 266
8.4 Fish and Game 266
8.5 Tekapo Whitewater Trust / Whitewater New Zealand 267
8.6 Meridian Energy 267
8.7 Mackenzie District Council 267
8.8 Mount Cook Alpine Salmon 267
8.9 New Zealand Transport Agency 268
8.10 Transpower New Zealand 268
8.11 Land Information New Zealand 268
8.12 Other Parties 269
8.13 Canterbury Regional Council 269

9. Conclusion ____ 270

LIST OF FIGURES

Figure 1: Tekapo PS Overview 3

Figure 2: Statutory Acknowledgements 4

Figure 3: Tekapo A Power Station Construction (1949) 51

Figure 4: Tekapo A Power Station and Surge Chamber Construction (1951) 52

Figure 5: Tekapo Intake During Construction (1951) 52

Figure 6: Tekapo Intake Nearing Completion (1952) 53

Figure 7: Tekapo A Power Station Turbine Hall (1952) 53

Figure 8: Tekapo Dam and Temporary Housing for Workers (May 1955) 54

Figure 9: Tekapo Canal Construction (1970) 54

Figure 10: Tekapo Canal Construction (1971) 55

Figure 11: Tekapo B Power Station Construction (1970) 55

Figure 12: Tekapo B Power Station Construction (1977) 56

Figure 13: Gate 16, viewed from Takapō 57

Figure 14: Gate 16 Radial Gates 59

Figure 15: Lake George Scott 59

Figure 16: Lake George Scott Weir operating during a release to the Takapō River 60

Figure 17: Gate 17, Tekapo Canal 61

Figure 18: Tekapo Power Scheme and the Upper Takapō River 62

Figure 19: Tekapo Intake Structure 63

Figure 20: Tekapo A Power Station 64

Figure 21: Tekapo A Power Station Turbine Hall 64

Figure 22: Tekapo Canal 65

Figure 23: Tekapo Canal Route (red line) 66

Figure 24: Tekapo Canal Lining Works 66

Figure 25: Tekapo B Power Station 67

Figure 26: The Waitaki Catchment 93

Figure 27: Takapō Mean Monthly Inflow and Outflow 101

Figure 28: Takapō Lake Levels 102

Figure 29: Takapō Wetlands / Waterbodies Monitored by PDP 104

Figure 30: Takapō Geomorphology (Northern Section) 109

Figure 31: Takapō Geomorphology (Southern Section) 109

Figure 32: Tekapo Canal Mean Monthly Flows 111

Figure 33: Flow Duration Curves - Lake Tekapo Spillway, Gate 17 and Lake George Scott Weir 113

Figure 34: Takapō River Basin Water Level Monitoring Sites 117

Figure 35: Potential Changes in Lake Shore Morphology (Northern Section) 156

Figure 36: Potential Changes in Lake Shore Morphology (Southern Section) 156

Figure 37: Takapō Operating Lake Levels 177

Figure 38: Map of the Four IBEP Geographic Zones. 180

Figure 39: Map of Zone 1 Showing Key Features. 181

Figure 40: Map of Zone 2 Showing Key Features. 185

Figure 41: Map of Zone 3 Showing Key Features. 186

Figure 42: Map of Zone 4 Showing Key Features. 188

Figure 43: The Tekapo White Water Course 200

LIST OF TABLES

Table 1: Persons and Groups Consulted 16

Table 2: Applicable National Policy Statements. 19

Table 3: Applicable National Environmental Standards. 21

Table 4: Requirements for a Substantive Application 23

Table 5: Clause 5 Information Required in Consent Application 27

Table 6: Clause 6 Information required to assess environmental effects 30

Table 7: Clause 7 Matters to be covered in assessment of environmental effects 31

Table 8: Tekapo Reconsenting – Assessment Criteria for Fast Track Approvals Process 35

Table 9: Tekapo PS Replacement Consents Sought 45

Table 10: Technical Reports Supporting this AEE 48

Table 12: Summary of Key Tekapo PS Resource Consent Obligations 71

Table 13: WAP Rules and Existing Consents 78

Table 14: CLWRP Rules and Existing Consents 80

Table 15: Lower Takapō River Median Monthly Flows 115

Table 16: Freshwater Birds Associated with Takapō, Takapō River and the Surrounding Environment. 130

Table 17: Recreation Significance by Waterbody 135

Table 18: Potential Changes in Lake Shore Morphology 151

Table 19: Summary of monthly water quality data collected by Mount Cook Alpine Salmon (January 2020 – September 2023). 161

Table 20: Vegetation Effects 169

Table 21: Expenditure Across the Four IBEP Zones. 180

Table 23: Proposed Zone 1 10 Year Action Plan Components. 182

Table 24: Proposed Zone 2 10 Year Action Plan Components. 184

Table 25: Proposed Zone 3 10-Year Action Plan Components. 187

Table 26: Proposed Zone 4 10-Year Action Plan Components. 188

Table 27: Matters to Which Control has been Reserved 254

LIST OF APPENDICES

Appendix A: Treaty Impact Assessment – Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki.

Appendix B: Letters of Support – Te Rūnanga o Arowhenua, Te Rūnanga o Waihao, Te Rūnanga o Moeraki and Te Rūnanga o Ngāi Tahu.

Appendix C: Landowners Adjacent to the Tekapo PS Core Land.

Appendix D: Proposed Resource Consent Conditions.

Appendix E: Draft Plans Referred to in the Proposed Consent Conditions.

Appendix F: Existing Environment Approach.

Appendix G: Tekapo Power Scheme – electricity sector benefits, 2025. Prepared by Concept Consulting Ltd.

Appendix H: Titles and Deeds of Easements.

Appendix I: Schedule 57 (Takapō, Lake Tekapo), Schedule 34 (Lake Pūkaki) and Schedule 72 (Waitaki River) Statutory Acknowledgements.

Appendix J: Tekapo Power Scheme Reconsenting: Natural Character, Landscape and Visual Amenity Effects Assessment 2023. Prepared by Boffa Miskell Limited.

Appendix K: Tekapo Power Scheme – Hydrological and Hydrogeological Analyses, 2023, reference number A02482505. Prepared by Pattle Delamore Partners Limited.

Appendix L: Tekapo Power Scheme reconsenting: assessment of aquatic environmental effects, 2023, Cawthron Report No. 3688. Prepared by Cawthron Institute.

Appendix M: Tekapo Power Scheme: Native Fish Assessment, Report 61-2018, 2023. Prepared by Water Ways Consulting Ltd.

Appendix N: Tekapo Power Scheme re-consenting: Lakeshore geomorphology and processes Existing environment and future effects, 2022. Prepared by Shore Processes and Management Ltd.

Appendix O: A Review of Terrestrial Invertebrate Information for the Tekapo Power Scheme Resource Consents, Entecol Report: ENT-063, 2023. Prepared by CP Ong & RJ Toft (Entecol Limited).

Appendix P: Tekapo Power Scheme re-consenting, Tekapo Herpetofauna Effects Assessment, Job 2004, 2023. Prepared by G Ussher (RMA Ecology Ltd).

Appendix Q: Tekapo Re-Consenting: Assessment of Ecological Effects – Avifauna, 2025. Prepared by BlueGreen Ecology Limited.

Appendix R: Tekapo Power Scheme Reconsenting Assessment of Effects – Vegetation, 2023. Prepared by Ecological Solutions Limited.

Appendix S: Tekapo Hydro Scheme Reconsenting Recreation Review, 2023. Prepared by Rob Greenaway & Associates.

Appendix T: Canterbury Policy Assessment: Canterbury Regional Policy Statement, Waitaki Water Allocation Plan and Canterbury Land and Water Plan Provisions.

Appendix U: Letters of Support.

EXECUTIVE SUMMARY

Introduction

Genesis Energy Limited (trading as "**Genesis**") owns and operates the Tekapo Power Scheme ("**Tekapo PS**" or "**the scheme**"), within the Waitaki Catchment. On average the Tekapo A and B stations directly provide electricity to the equivalent of more than 120,000 New Zealand homes annually and the Tekapo PS (through diverting water into Lake Pūkaki for use through the Ōhau power stations) directly and indirectly provides electricity to the equivalent of more than 228,000 New Zealand homes annually. The Tekapo PS thus has significant regional and national benefits.

The scheme operation is authorised by several resource consents (granted by the Canterbury Regional Council) and activities permitted under relevant regional plans. Resource consents relating to the damming, taking, diverting, use and discharge of water relating the Tekapo PS operation expire in 2025 and replacement resource consents (where the activity is not permitted under the relevant regional plans) are required to allow its continued operation beyond 2025. Genesis is therefore seeking the following approvals under the Fast-track Approvals Act 2024 ("**FTA**"):[1]

1. A **Water Permit** – To dam, take, divert and use water associated with the operation of the Tekapo PS, which includes the damming of the Takapō River (hereafter referred to as the "**Takapō River**") via the Lake Takapō (hereafter referred to as "**Takapō**") Control Structure ("**Gate 16**") to control and operate the levels of Takapō, the taking, diversion and use of water from Takapō via the Tekapo Intake Structure for the generation of electricity, and ancillary purposes, at the Tekapo A and B Power Stations ,the damming of the Takapō River at the Lake George Scott Control Weir to control and maintain water levels in Lake George Scott and the taking, diversion and use of water from the Takapō River via the Tekapo Canal Control Structure ("**Gate 17**"); and

2. A **Discharge Permit** – To discharge water and associated contaminants associated with the operation of the Tekapo PS, which includes the discharge of water and associated contaminants into the Takapō River from Gate 16 for the purposes of spilling water, to bypass Tekapo A, for Lake George Scott water level maintenance and for recreational release purposes, the discharge of water and associated contaminants into the Takapō River from the Lake George Scott Control Weir for the purpose of spilling water and the discharge of water and associated contaminants into Lake Pūkaki.

[1] The Tekapo Power Scheme "Applications for Replacement Resource Consents to Continue to use, operate, and maintain the power scheme comprising Tekapo A Power Station and substation, Tekapo B Power Station and substation, and the canal system, and connect and supply electricity to the national grid" is a listed project in Schedule 2 (page 102) of the FTA.

Genesis is not proposing to materially change any of the operating parameters associated with the Tekapo PS.

The new resource consents needed for the Tekapo PS are fundamental to its ongoing operation and are classified as "controlled activities" under the Waitaki Catchment Water Allocation Regional Plan ("**WAP**") and the Canterbury Land and Water Regional Plan ("**CLWRP**").

The Tekapo Power Scheme

Since 1935, water in the Waitaki catchment has been used to generate electricity for the national grid.

The Tekapo PS comprises two hydro-electric power stations, referred to as "Tekapo A" (capacity 30 MW), and "Tekapo B" (capacity 160 MW). Water is piped via the Tekapo Intake Structure to the Tekapo A power station from where it is released into the Tekapo Canal. Water then passes through the Tekapo B power station, before discharging into Lake Pūkaki. Water released from Takapō via gate 16 into the upper Takapō River is impounded in Lake George Scott and can be discharged into the Tekapo Canal via Gate 17, bypassing the Tekapo A station but passing through Tekapo B. Water from Takapō can also flow over Lake George Scott Weir and continue down the Takapō River to Lake Benmore.

Downstream of the Tekapo PS infrastructure, Meridian Energy Limited ("**Meridian**") operates the Waitaki Power Scheme. The Combined Waitaki Power Scheme (incorporating both the Waitaki Power Scheme and Tekapo PS) hydro-electric power stations and associated infrastructure were originally built and managed together. The Combined Scheme includes eight power stations: Tekapo A, Tekapo B, Ōhau A, Ōhau B, Ōhau C, Benmore, Aviemore and Waitaki. The Combined Waitaki Power Scheme is the largest hydroelectric generating system in New Zealand generating up to 25% of New Zealand's annual electricity requirements, with Lakes Takapō and Pūkaki providing up to 65% of the country's hydro average storage volume.

Cultural Setting

The cultural setting for these applications is described in the Treaty Impact Assessment prepared by Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki (together, "**Manawhenua**" or the "**Waitaki Rūnaka**") for the Tekapo PS.

In summary, Kāi Tahu has a long association and involvement with the Waitaki catchment and it remains of paramount importance to the iwi. The Crown has recognised this significance in the Ngāi Tahu Claims Settlement Act 1998, including through statutory acknowledgements of various waterbodies in the Waitaki catchment.

As Manawhenua, the members belonging to the three Papatipu Rūnanga, Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki have a responsibility to assess how the Tekapo and Waitaki Power Schemes (the Schemes) impact their rights, values and practices. Manawhenua have prepared a Treaty Impact Assessment, included as **Appendix A**, to:

a. Identify the effects of the Tekapo and Waitaki Schemes on the cultural beliefs, values and practices of Kāi Tahu;

b. Summarise how Meridian and Genesis propose to mitigate those impacts; and

c. As a result, the extent to which the consent applications are consistent with Manawhenua expectations, informed by Te Tiriti o Waitangi.

The Existing Environment

The Tekapo A power station was commissioned in 1951 and Tekapo B was commissioned in 1977, with the scheme (including existing structures and associated water takes, uses, damming and discharges) now forming part of the existing environment. The 'existing environment' for the assessments contained within this assessment of environmental effects is the current state of the environment, including existing environmental processes. Excluding the Tekapo PS from the existing environment would be unrealistic, and an alternative 'without' environment that does not include the Tekapo PS structures and associated takes and discharges would be artificial and fanciful. Under Policy 4.51 of the CLWRP, the existing Tekapo PS is considered as part of the existing environment in recognition of its national benefits in terms of the generation of electricity from a renewable energy source.

The description of the existing environment in this assessment of environmental effects and the technical assessments supporting the applications for resource consent therefore consider the environment with the Tekapo PS in existence. In that regard, the assessment of the actual and potential effects of the Tekapo PS focusses on the effects of the on-going operation of the scheme on the values currently supported by waterways influenced by the operation of the Tekapo PS. The information contained within this assessment of environmental effects does not attempt to compare the current environment with that which was likely present before the development of the Tekapo PS.

Assessment of Effects

The effects of the Tekapo PS, and are summarised in the following table:

Effect	Key Conclusions
Positive effects	The Tekapo PS generates substantial volumes of 100% renewable electricity. In energy terms, the Scheme's average annual output (from both direct and indirect generation) is sufficient to supply approximately 228,000 Canterbury households, equivalent to more than 90% of the occupied private dwellings in Canterbury. Hydro generation such as that provided by the Tekapo PS is important because it has access to stored water in Takapō. This type of generation has the twin benefits of being renewable and controllable, both of which

Effect	Key Conclusions
	will be increasingly important as New Zealand decarbonises its economy. In addition to its contribution to national electricity supply, the Tekapo PS provides power to consumers in the Tekapo Albury region valued at approximately $17 million (present value). The Tekapo PS has also resulted in improved fishery experiences within the Tekapo Canal, which also forms part of the Alps to Ocean cycleway (one of New Zealand's Great Rides) and created the environment within which Mt Cook Salmon operates.
Cultural	The Waitaki Catchment holds immense significance to Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki (Waitaki Rūnaka or Ngā Rūnaka). Waitaki literally means “the waterway of tears” and the name is often said to represent the tears of Aoraki, the ancestor of Ngāi Tahu embodied in the mountain. The wai māori of the valleys and basins of the takiwā of Ngā Rūnaka descend from Aoraki and the mauka of Te Waipounamu to the sea. The awa are the lifeblood of the surrounding land and its peoples. The catchments and streams are the veins of the whenua; a source of nourishment, and a living system connecting the peoples of Ngāi Tahu with their ancestor, with mahika kai, with countless taonga, and with each other. Kāi Tahu are of the view that the effects of the developments in the Upper and Mid Waitaki, and the resultant river flows, allocations and management regimes across the Waitaki have negatively affected Kāi Tahu rights and interests and have adversely affected experiences and opportunities for whānau in the catchment. Waitaki Rūnaka acknowledge the importance of hydro generation as a source of renewable energy, and the benefits it has provided to past, current and future generations. The Waitaki Rūnaka have worked with the Generators to set a pathway whereby, over time, adverse effects will be addressed. Waitaki Rūnaka believe that the consent conditions, the agreed package of interventions and the enhanced relationship negotiated with the Generators will enable an intergenerational response that will result in adverse effects being avoided, remedied or mitigated.
Landscape natural character and visual amenity	The continued operation the Tekapo PS will not modify the present values and characteristics of the Mackenzie Basin nor will it adversely affect natural character, landscape and visual amenity values.
Hydrology	As no changes are proposed to the Takapō operating regime, no changes to the hydrology of the lake or the Takapō River are expected to occur from reconsenting the Tekapo PS.

Effect	Key Conclusions
	Wetlands and other water bodies bordering Takapō and the Takapō River can be influenced by lake and river level fluctuations where they are hydraulically connected to the lake or river. This pattern of interaction will not be altered from reconsenting the Tekapo PS as no changes to the current operating regimes are proposed.
Freshwater ecology and water quality	As there are no changes to the operation of the Tekapo PS being sought as part of the reconsenting process, no changes to the existing environment are anticipated. Overall, the existing operation of the Tekapo PS: a. Has no effect on the water quality and contributes to the naturally low productivity and restricted food supply for salmonids in Takapō; b. Provides a productive environment for macroinvertebrates and salmonid fish in the Tekapo Canal supporting a nationally significant (and internationally recognised) and popular fishery; c. Has minor adverse effects, as well as minor positive effects, on water quality and aquatic ecology within the Tekapo River; and d. Has no more than minor adverse effects on receiving waters in Lake Pūkaki and Lake Benmore.
Shoreline morphology	The effects of the continued operation of the Tekapo PS on the Takapō physical shore processes are identified as follows: a. Continued but episodic erosion of currently eroding cliffs; b. Continued alongshore transport of sediment from fluvial source (rivers and streams) and backshore erosion; c. Slow landward movement and elevation of barrier beaches; and d. Continued inundation of low-lying land and river and stream mouths at high lake levels. The projected effects on the physical shoreline processes on Takapō of continued operation of the Tekapo PS under the current operating regime are likely to be of the same character and order of magnitude as in the existing environment.
Native fish	Overall, the Tekapo River supports the expected range of native fish, given the context of effects within the Waitaki catchment that influences the distribution and abundance of the native fish. For threatened native galaxiids, the present-day distribution indicates that the pre-development Takapō River was unlikely to have supported populations of these fish and the Tekapo PS is unlikely to have any effect on their abundance.
Terrestrial invertebrates	The key ongoing potential effects of the Tekapo PS and reduced severity and frequency of flood events are identified as increased accessibility to predators, exacerbated weed problems, fire (particularly from the added

Effect	Key Conclusions
	fuel load of weeds), and reduced deposition and maintenance of sandy substrates, which are key habitats for some species. However, the reduced severity of flood events is also a potential positive for the species needing more stable habitat features. The changes to terrestrial invertebrate communities from managed flow regimes to the Takapō River have already occurred over the preceding decades, and ongoing changes to the existing communities caused by the Tekapo PS will be small.
Herpetofauna	The level of potential effects of the Tekapo PS in terms of loss of ecology values affecting herpetofauna is assessed as 'Very low'. Genesis proposes the continuation of and increased funding for a native biodiversity enhancement programme that is likely to result in beneficial outcomes for native lizards, through its focus on weed control and nesting bird protection across very large areas of the upper Waitaki Basin. This programme will provide conservation benefits that greatly exceed the very minor level of adverse effects that may be caused by the re-consenting of the Tekapo PS on native lizards.
Avifauna	Overall, the construction of the Combined Waitaki Power Scheme resulted in the loss of braided river and swamp / wetland habitat but increased open water (lake) and lake shoreline habitat. However, it is not possible to determine the specific effect of the Tekapo PS on avifauna due to the inter-related nature of ecosystem variables and additional factors both within and beyond the Tekapo catchment. Based on Takapō River surveys conducted since 1991, banded dotterel, black-fronted tern, NZ pied oystercatcher and wrybill (Threatened or At Risk) have shown declines in overall abundances, while the abundance of several native (Not Threatened) and introduced species appear to have increased over the same period, including black swan, Canada geese, little shag and white-faced heron. Analysis of specialist riverbirds has shown positive benefits due to initiatives funded by Genesis and Meridian but also indicate that additional pressures beyond the scheme are threatening several populations.
Vegetation	Since the Tekapo PS was established, the vegetation communities around the scheme have developed under a regime of managed water levels in the lake and managed flows in the Takapō River. The vegetation found there reflects that management and is not expected to be affected to any more than a very low level by continued operation under the same control levels. The overall magnitude of unmitigated local (ecological district) effects ranges from low to very low. In the absence of initiatives currently funded by Genesis and Meridian the ecological values of the currently managed areas would slowly

Effect	Key Conclusions
	degrade over time as exotic species come to dominate as they do in the lower catchment.
Recreation	Takapō supports a wide variety of on-water recreation activities, including boating and angling as well as walking and cycling opportunities around generation infrastructure, which have international significance via the scenic values and the contribution these make to the tourism industry. Te Manahuna Mackenzie Basin hydro canal fishery (which includes the Tekapo, Pūkaki and Ōhau canals) makes a substantial contribution to the local economy, with a total economic impact of $13,6m for the 2022-2023 fishing season, representing approximately 3.5% of the total GDP of the region.

As no alterations to the current operational parameters of the Tekapo PS are proposed, no changes to the environment are expected as part of its continued operation. Given that the existing environment, with the infrastructure and current operating regime in place, is the baseline for the assessment of actual and potential effects of the ongoing operation of the Tekapo PS, there will be no additional adverse effects.

Environmental Compensation

Genesis is proposing to continue (and significantly increase) its funding for an indigenous biodiversity enhancement programme[2] as a core part of the replacement resource consents being sought, to mitigate the effects of the Tekapo PS on the environment. The funding contributes to improving the condition, resilience and ecological processes of indigenous biodiversity and related values of the braided rivers and associated environment including the wetlands within the Waitaki catchment.

Summary

Granting resource consents for the damming of the Takapō River, the taking and diversion of water from Takapō and the Takapō River, and the discharge of water and associated contaminants into Lake Pūkaki and the Takapō River from Tekapo PS operations to replace consents that expire in 2025, to provide for the ongoing operation of the Tekapo PS will facilitate the continued delivery of infrastructure that has significant regional and national benefits and is consistent with the purpose of the FTA. The conditions proposed by Genesis will appropriately manage the ongoing adverse effects of the Tekapo PS.

[2] Project River Recovery, the existing indigenous biodiversity enhancement programme funded by Genesis and Meridian, was established in 1991 as compensation for habitats lost from building the Waitaki hydro system and is an award-winning, world-leading conservation effort (see for example, https://predatorfreenz.org/stories/rivers-rare-waitaki/).

1. INTRODUCTION

1.1 BACKGROUND AND OVERVIEW

Genesis Energy Limited ("**Genesis**" or "**the company**") owns and operates the Tekapo Power Scheme ("**Tekapo PS**") within the Waitaki River catchment located in the Mackenzie District and the wider Canterbury region. The operation of the Tekapo PS was initially authorised by Orders in Council dated 24 April 1929 and 27 September 1939 and more recently by water rights (deemed resource consents under the Resource Management Act ("**RMA**")) since 1990. The deemed resource consents expire on 30 April 2025.

Replacement resource consent applications for the Tekapo PS were lodged with the Canterbury Regional Council ("**CRC**") in July 2023 more than six months in advance of the expiry of the existing consents so that the provisions of section 124 of the RMA applied to enable Genesis to continue to exercise its existing consents until a decision on the applications is finalised.

Having been confirmed as a listed project in Schedule 2 of the Fast-track Approvals Act 2024 "**FTA**"), Genesis is lodging an application for resource consents with the Environmental Protection Authority ("**EPA**") that would otherwise be applied for under the RMA for the continued operation of the Tekapo PS.

This Assessment of Environmental Effects ("**AEE**") has been prepared in support of resource consent applications by Genesis under the FTA to enable the ongoing operation of the Tekapo PS.

The Tekapo PS, as shown in the overview in Figure 1, comprises two hydro-electric power stations, referred to as "**Tekapo A**" (capacity 30 megawatts or "**MW**") and "**Tekapo B**" (capacity 160 MW). Water for electricity generation is stored in Takapō by virtue of control gates ("**Gate 16**") where the lake discharges into the Takapō River.

The water diverted / used by the Tekapo PS generates electricity within multiple power stations and forms part of the Combined Waitaki Power Scheme ("**WPS**").

Water in Takapō flows by gravity through a tunnel to the Tekapo A power station and is then released into the Tekapo Canal from where it flows by gravity to the Tekapo B power station, before discharging into Lake Pūkaki. This water adds to the overall water storage options for the Tekapo PS and six other power stations operated by Meridian Energy Limited ("**Meridian**") downstream of Lake Pūkaki.

In addition, the Takapō River is dammed approximately three kilometres downstream of Gate 16 by a concrete weir, creating Lake George Scott. Water released from Takapō via Gate 16 and impounded in Lake George Scott can be discharged into the Tekapo Canal via "**Gate 17**", bypassing the Tekapo A station but enabling generation at the Tekapo B power station, further

storage in Lake Pūkaki and generation in six other power stations operated by Meridian downstream of Lake Pūkaki. Water from Takapō can also flow over Lake George Scott Weir and continue down the Takapō River to Lake Benmore, but in doing so would not be available for generation in three Meridian stations (Ōhau A, B and C).

The WPS provides a significant contribution of renewable electricity generation to New Zealand, with annual average generation being between 7700 GWh and 8100 GWh since 2003. This comprises, on average, 25% of Aotearoa New Zealand's renewable electricity generation. The WPS typically provides up to 65% of New Zealand's controllable hydro storage capacity.[3]

The Ngāi Tahu Claims Settlement Act 1998 includes Statutory Acknowledgements for Takapō (where water for the Tekapo PS is diverted and taken) and Lake Pūkaki (where water that is diverted and taken for the Tekapo PS is discharged). There are also Statutory Acknowledgements downstream of the Tekapo PS for Lakes Benmore and Aviemore and the Waitaki River. These acknowledgement areas are shown in Figure 2.

Genesis has worked collaboratively with Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki ("**Waitaki Rūnaka**") in respect of the applications for replacement consents for the Tekapo PS and will continue to do so throughout the application process. Agreement has been reached with Waitaki Rūnaka on a package that includes conditions to be attached to the resource consents, a compensation package for the duration of the consents, a relationship agreement between Genesis/Meridian and Waitaki Rūnaka and a suite of measures that further provide for the management of adverse effects on Waitaki Rūnaka with this Kāi Tahu taonga. The Waitaki Rūnaka and Te Rūnanga o Ngāi Tahu have provided letters of support for the application.

Genesis has also reached agreement with the Department of Conservation ("**DoC**") regarding the continuation of and increased funding for an indigenous biodiversity enhancement programme, Central South Island Fish and Game Region ("**Fish and Game**") regarding game fish matters (including fish salvage), whitewater interests regarding recreational releases of water and Mackenzie District Council ("**MDC**") regarding matters relevant to the operation of the Tekapo PS.

[3] Internal Genesis advice, based on historical average storage.

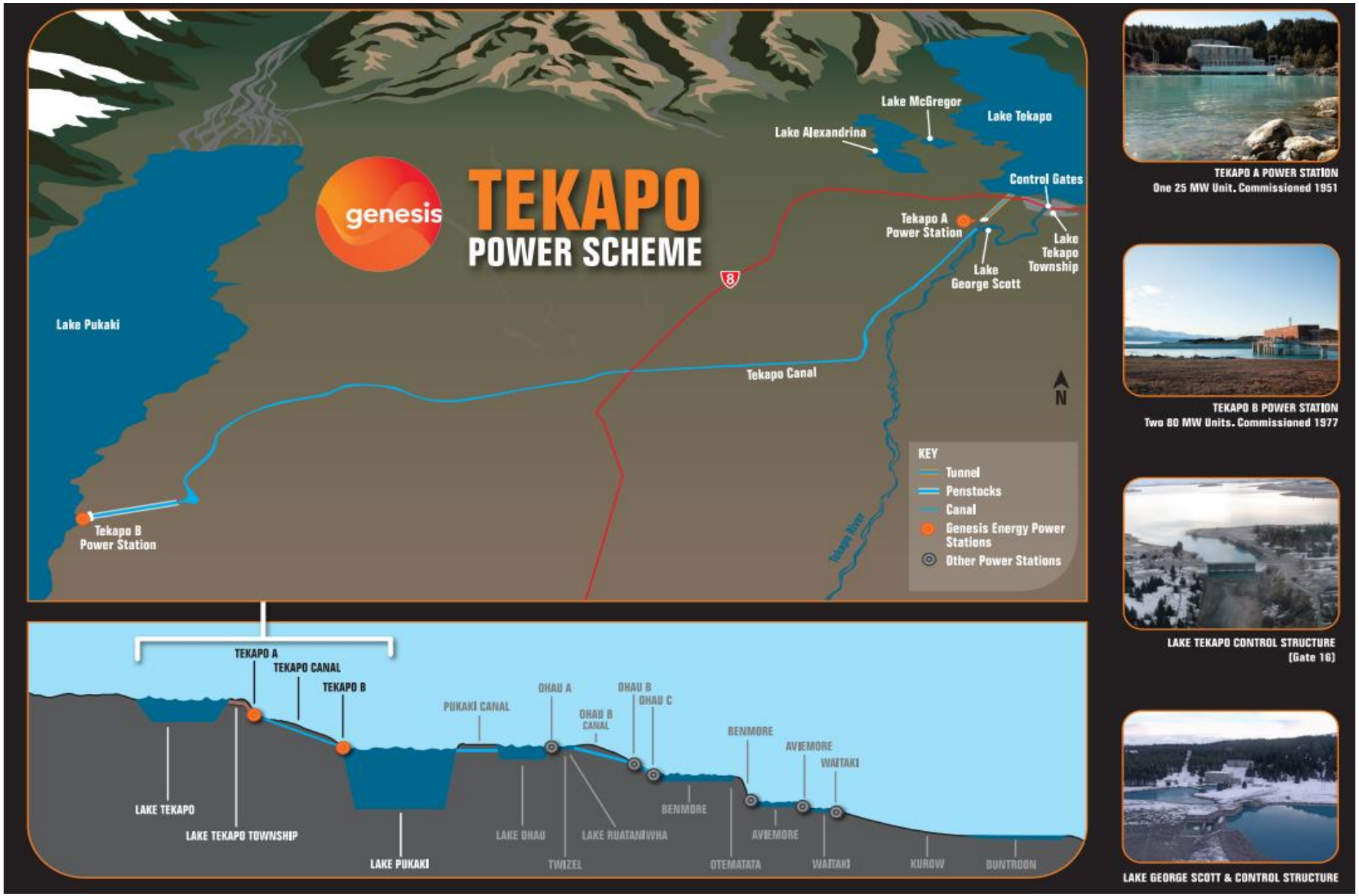

Figure 1: **Tekapo PS Overview**

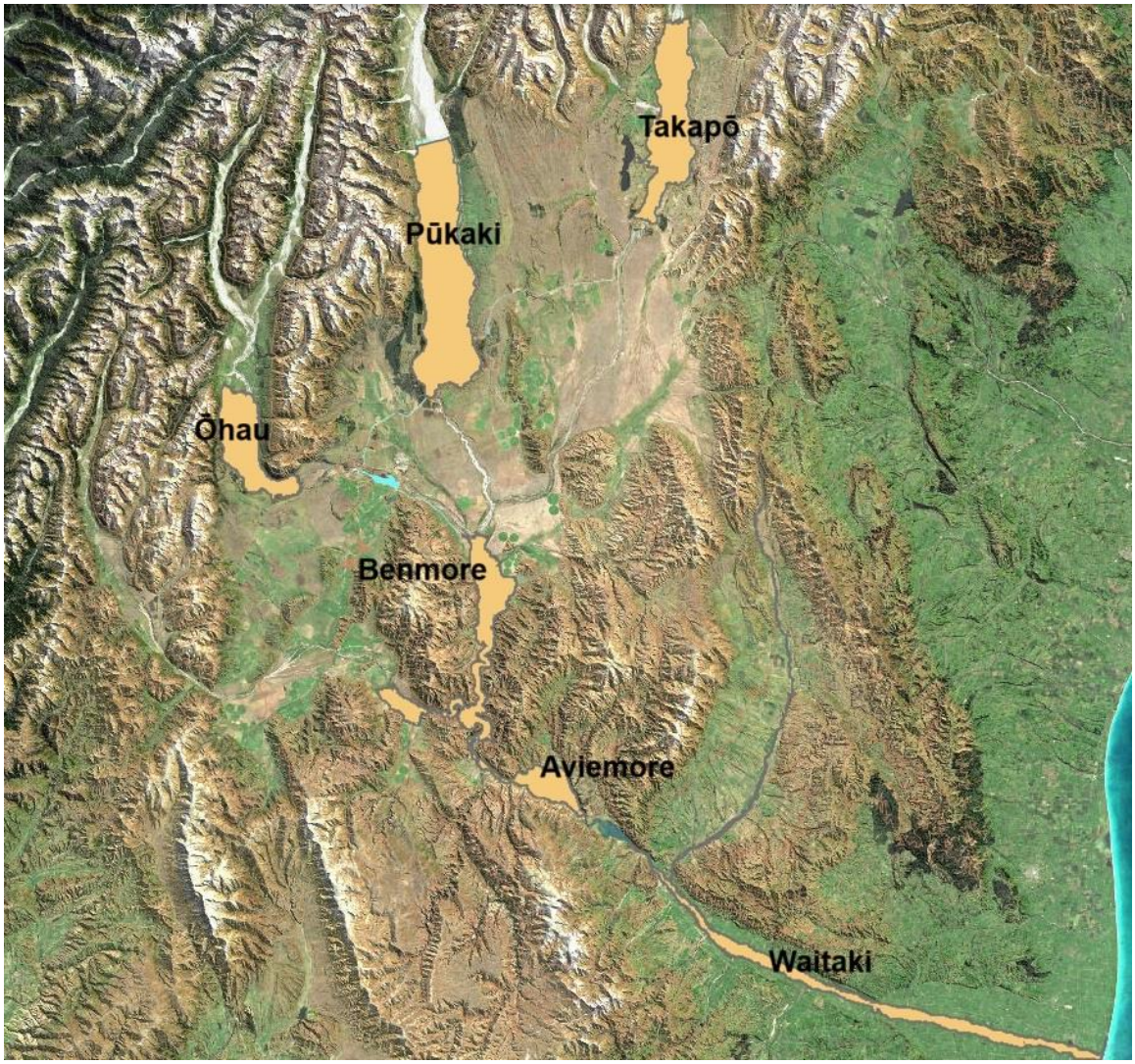

Figure 2: Statutory Acknowledgements

1.2 THE PURPOSE OF THE FAST-TRACK APPROVALS ACT

The purpose of the FTA is:

> *to facilitate the delivery of infrastructure and development projects with significant regional or national benefits.*

The Tekapo PS reconsenting project demonstrably achieves the purpose of the FTA by delivering significant benefits to both the Canterbury Region and New Zealand more broadly. In that regard, on average the Tekapo A and B stations directly provide electricity to the equivalent of more than 120,000 New Zealand homes annually and the Tekapo PS (through diverting water into Lake Pūkaki for use through the Ōhau power stations) directly and indirectly provides electricity to the equivalent of more than 228,000 New Zealand homes annually.

The resource consents sought for the Tekapo PS will maintain existing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions and will maintain security of electricity supply at local, regional and national levels using a renewable natural resource. The consents sought provide for maintenance of the existing renewable electricity generation output of the Tekapo PS and will make an important contribution to meeting or exceeding the New Zealand Government's national target for the generation of electricity from renewable resources.

The current 2050 target for reduction in greenhouse gas emissions requires at least net zero emissions of all greenhouse gases (other than biogenic methane and excluding emissions from international shipping and aviation) by 2050. The Climate Change Commission's recent recommendation[4] to the Government is that the 2050 target be amended to require net emissions of all greenhouse gases other than biogenic methane to reach at least net negative 20 MtCO2e by 2050 (including emissions from international shipping and aviation).

The Government has identified that achieving the current target will require actions like doubling Aotearoa New Zealand's renewable energy as part of the pathway to a low emissions economy. Achieving the proposed amended target will require even greater utilisation of renewable energy and use of renewable electricity generation. Providing for the continuation of existing renewable electricity capacity is therefore essential for achieving Aotearoa New Zealand's 2050 target for reduction in greenhouse gas emissions.

The Act is designed to provide an approvals process for significant proposals, primarily to minimise delays and costs. Recognising the size and significance of the Tekapo PS along with the significant contribution that it makes to meeting Aotearoa New Zealand's 2050 target for reduction in greenhouse gas emissions means that it is an ideal project for processing under the FTA.

Once the EPA has decided under section 46 of the FTA that a substantive application for a listed project lodged with it complies with the requirements in section 46(2), it will be passed to the panel convenor who will then set up an expert panel for consideration and determination of the application.

1.3 LAKE TAKAPŌ AND TAKAPŌ RIVER

Please refer to the Treaty Impact Assessment ("**TIA**") prepared by Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki for the Tekapo PS. The full TIA is included as **Appendix A** to this AEE.

[4] He Pou a Rangi Climate Change Commission, November 2024 "*Review of the 2050 target and of international shipping and aviation emissions*".

As recorded in the TIA, Schedule 57 of the Ngāi Tahu Claims Settlement Act 1998 acknowledges that:

a. Takapō is one of the lakes referred to in the tradition of "Ngā Puna Wai Karikari o Rakaihautu" which tells how the principal lakes of Te Wai Pounamu were dug by the rangatira (chief) Rakaihautu. Rakaihautu was the captain of the canoe, Uruao, which brought the tribe, Waitaha, to New Zealand. Rakaihautu beached his canoe at Whakatū (Nelson). From Whakatū, Rakaihautu divided the new arrivals in two, with his son taking one party to explore the coastline southwards and Rakaihautu taking another southwards by an inland route. On his inland journey southward, Rakaihautu used his famous kō (a tool similar to a spade) to dig the principal lakes of Te Wai Pounamu, including Takapō.

b. For centuries, Takapō discharged its waters into the Takapō River which after its junction with the Pūkaki became known as the Waitaki, to be subsequently joined by the Ōhau, Ahuriri and numerous other rivers and streams. The Takapō River was one of the feeders of the mainstem Waitaki River.

c. The wider Takapō area was an important part of the extensive food gathering area renowned for tuna (eels) and weka. Other wāhi taoka present included kāika, mauka, pā, motu, puna, repo, rock art, urupā, taoka species, mahika kai, and trails. The Takapō formed part of the seasonal cycle of gathering. This pattern of rotation has been disrupted by the degradation of mahika kai in the Waitaki, thus extending the spatial extent of the impacts beyond the Waitaki catchment boundaries.

1.4 GENESIS ENERGY

Genesis is a diversified energy company. It sells electricity, reticulated natural gas and LPG through its retail brands of Genesis and Frank Energy. It is one of New Zealand's largest energy retailers with around 500,000 customers. The company generates electricity from a diverse portfolio of thermal and renewable generation assets located in different parts of Aotearoa. The spread of locations and fuel types in the portfolio provides Genesis significant operating flexibility. Genesis also has a 46% interest in the Kupe Joint Venture, which owns the Kupe Oil and Gas Field offshore of Taranaki, New Zealand.

Genesis' portfolio of generation assets comprises:[5]

1. The Huntly Power Station including two modern gas fired and three gas/coal fired generating units with a nominal capacity of approximately 1204 MW, which is the

[5] Generation capacity as per Genesis Annual Report, 2024.

largest electricity generation facility in New Zealand by capacity. A nominal 100 MW lithium-ion battery is planned at Huntly.

2. Three renewable generation hydro schemes, Tongariro (362 MW), Waikaremoana (138 MW) and Tekapo (190 MW). These schemes comprise eight power stations, with six being located in the North Island and two in the South Island.

3. A 63 MWp solar farm at Lauriston, Canterbury (with joint venture partner FRV Australia).

Genesis is committed to playing its role in decarbonising the New Zealand economy. It has worked with the Science Based Targets initiative (SBTi) to set carbon reduction targets for the 2025 financial year ("**FY**") aligned with limiting global warming to below 1.5°C and have submitted long term targets for validation to FY 2040, in line with Science Based Target's Corporate Net zero standard.

For FY25, Genesis has a target to reduce absolute Scope 1 generation emissions by 36% and reduce absolute Scope 3 emissions from the use of products it sells by 21%. These targets are equivalent to more than 1.2 million tonnes of carbon by 2025 or removing more than 272,000 petrol cars from the road for one year.

Genesis has also submitted a net zero emission reduction target in line with the SBTi Corporate Net Zero guidance for validation, targeting to meet net zero criteria by 2040.

Genesis' strategy, Gen35, outlines its plans for taking action over the next 10 years to reduce its emissions by growing renewables, supporting customers to electrify, and managing increasing energy demand, while ensuring customers have reliable and cost-effective energy. Under the Gen35 pillar to "Grow renewables", Genesis is aiming to secure 8,300 GWh of new renewable electricity generation by FY35.

Initial Gen35 initiatives to deliver new renewables include:

1. Signing a Power Purchase Agreement ("**PPA**") with Contact Energy to supply Genesis with geothermal energy for 15 years, beginning in 2025. The PPA enables Genesis to take up to 62.5 MW of electricity, equivalent to approximately 533 GWh, or 41% of the output capacity from Contact's geothermal power station at Tauhara near Taupō. The 152 MW power station became fully operational in November 2024. Tauhara is expected to replace 1.3 terawatt hours of thermal generation from across New Zealand's electricity system, displacing 450,000 tonnes per year of carbon emissions.

2. Genesis will co-develop new solar generation through a joint venture partnership. Genesis has entered into a JV agreement with FRV Australia (a leading utility-scale solar farm developer, asset owner and renewable energy platform) to deliver up

to 500 MW of solar capacity (~740GWh per annum) over the next five years. Genesis now has four publicly released solar projects:

a. Lauriston solar farm, a 63 MWp joint venture solar farm on the Canterbury Plains. Lauriston was commissioned in November 2024 and is now generating at full capacity.

b. An advanced stage 127 MW consented solar farm in Edgecumbe being independently developed by Genesis, with first generation expected in 2027.

c. A 200 MWp early-stage solar development near Foxton in Manawatū-Whanganui that was accepted for inclusion in the Fast Track Approvals Act and is being developed as a joint venture with FRV. Construction is expected to commence in 2026.

d. In February 2025 Genesis announced the conditional purchase of an advanced stage 67 MWp solar development in Leeston, which is expected to start generating electricity in 2027.

3. Partnering with Mercury Energy Limited (formerly Tilt Renewables) on an electricity offtake agreement for the 133 MW Waipipi wind farm in South Taranaki which commenced operations in November 2020. Genesis has a 20-year electricity offtake agreement for the energy from Waipipi's 31 wind-turbines. The generation capacity of the site is 133.3 MW and it produces approximately 450 GWh per year. This is enough to power about 65,000 homes and will enable a reduction of up to 250,000 tonnes of carbon, equivalent to removing approximately 55,000 petrol cars from New Zealand roads.

4. Executing a conditional 20-year electricity offtake agreement with Mercury Energy Limited (formerly Tilt Renewables) for additional wind energy. Genesis has an agreement for the energy from Kaiwaikawe, a 77 MW wind farm[6] located near Dargaville, Northland. The agreement allows for Genesis to purchase all energy produced by the wind farm (around 230 GWh per annum). The Kaiwaikawe wind farm output is equivalent to thermal generation that would otherwise produce an estimated 180,000 tonnes of carbon emissions per annum.

In respect to its approach to environmental management more generally, Genesis seeks to efficiently use the resources available to it, while working alongside tangata whenua and local communities, and looking after the environment in which it operates. Genesis recognises that in addition to its shareholders, the Company interacts with many other

[6] Construction of the Kaiwaikawe Wind Farm was announced in December 2024 with first generation planned for mid-2026.

stakeholders, including the communities within the rohe on which it operates its generation assets and business activities, customers, suppliers and creditors and local and central government regulatory bodies and non-governmental organisations. The Company has adopted and promoted a range of policies and practices which reflect the respect it holds for its stakeholders and the value that good relationships with stakeholders deliver to the Company and its shareholders. These include recognising the role of tangata whenua (the people of the land) as kaitiaki of the natural resources and taonga within their rohe, respecting Treaty of Waitangi principles and developing pro-active and constructive long-term relationships with tangata whenua, communities and organisations where the Company operates.

In the Waitaki Catchment, Genesis acknowledges the mana of Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki, and their role and responsibilities as mana whenua, rangatira and kaitiaki of the natural resources and taonga within their rōhe.

Genesis operates an Environmental Management System ("**EMS**") which utilises business systems to manage the company's effects and requirements for environmental management across all of Genesis' projects and operational sites. The EMS provides the necessary controls and instructions to achieve the company's commitment to environmental excellence and requirement to comply with all environmental legislation. The EMS applies to all activities involving the use of natural and physical resources and the environment, from the conceptual stage of any project through to normal operational activities of Genesis. Genesis holds all relevant statutory authorisations and resource consents for the operation of its assets, including those required under the RMA. This provides a sound basis for identifying and managing environmental effects, reporting on environmental performance and reviewing what constitutes the best practicable option for various activities.

1.5 APPROACH TO THESE RESOURCE CONSENT APPLICATIONS

1.5.1 Fast Track Approval Process

Replacement resource consent applications for the Tekapo PS were lodged with the CRC in July 2023 more than six months in advance of the expiry of the existing consents so that the provisions of section 124 of the RMA applied to enable Genesis to continue to exercise its existing consents until a decision on the applications is finalised. Since then, Genesis has been engaging with the Council responding to a detailed section 92 request from the Council. The resource consents applied for seek to maintain "status quo" flow regimes and to maintain the existing environment. The Tekapo PS has been in operation for several decades (since 1951 in the case of Tekapo A Power Station) and extensive technical assessments mean there is a good understanding of the effects of the scheme and the national significance of the scheme for renewable generation.

As identified in this application, Genesis has worked with affected parties and has secured agreements relating to the continued operation of the scheme. Genesis therefore considers that the application for replacement consents to enable the continued status quo operation of the Tekapo PS can be effectively managed through the FTA process enabling a focus on appropriate conditions for the continued operation. In that regard, The Tekapo PS is listed in Schedule 2 (page 102) of the FTA:

> *Genesis Energy Limited Tekapo Power Scheme— Applications for Replacement Resource Consents; Continue to use, operate, and maintain the power scheme comprising Tekapo A Power Station and substation, Tekapo B Power Station and substation, and the canal system, and connect and supply electricity to the national grid Between Lake Tekapo (higher elevation), to the northeast near Tekapo, and Lake Pūkaki (lower elevation) to the southwest near Twizel.*

1.5.2 Decision making

When considering the Tekapo PS application for resource consent, the Panel must apply the relevant decision-making criteria set out in sections 81–85 and clauses 17–18 of Schedule 5 of the FTA.[7] An overview of these requirements is provided in Table 8 below.

Requirements on the Panel

Within the applicable timeframe, the Panel must issue its decision granting the resource consents sought and setting any conditions or declining the application.[8] In making its decision the Panel must:

a. Consider:
   i. This substantive application;[9]
   ii. Any advice and reports the Panel convener has obtained;[10]
   iii. The report on Treaty settlements and other obligations;[11]
   iv. The comments it has received from invited persons or groups within the specified timeframe, and the applicant's response to those comments;[12]
   v. Any information received by the Panel during a hearing, if a hearing is held;[13]

---

7 Clauses 19–22 of Schedule 5, referred to in ss 81(2)(b) and (3)(a), are not relevant as the application does not concern standard freshwater fisheries; aquaculture; or a coastal permit.

8 FTA, ss 79 and 81(1).

9 FTA, s 81(2)(a).

10 FTA, ss 51 and 81(2)(a).

11 FTA, ss 18, 52 and 81(2)(a).

12 FTA, ss 53, 55 and 81(2)(a) and (6).

13 FTA, ss 58 and 81(2)(a).

vii. Any responses to further information requests to the applicant or peer review advice;[14]

viii. Any response from the applicant on the draft decision and any responses from the applicant and persons and groups invited to comment on the draft conditions;[15]

ix. Any responses to further information requests to the relevant administering agency or local authority;[16] and

x. Any comments from the Minister for Māori Crown Relations: Te Arawhiti and the Minister for Māori Development on the draft decision, including any draft conditions.[17]

b. Apply the criteria in clause 17 of Schedule 5 (discussed below);[18] and

c. Comply with section 82 (discussed below), if applicable.[19]

The Panel has discretion to:

d. Consider any advice, report, comment, or other information received outside the specified timeframe in the FTA;[20] and

e. Impose conditions (limited by provisions in the FTA and, for the Tekapo PS, by section 104A(b) of the RMA).[21]

Criteria for assessing resource consent application

In considering the resource consent application, the Panel is required to take into account:[22]

a. The purpose of the FTA;

---

14 FTA, ss 67 and 81(2)(a) and (6)

15 FTA, ss 69, 70 and 81(2)(a) and (6).

16 FTA, ss 81(2)(a) and 90.

17 FTA, ss 72 and 81(2)(a).

18 FTA, ss 81(2)(b) and (3)(a).

19 FTA, s 81(2)(c).

20 FTA, s 81(6).

21 For example, under s 81(2)(e) of the FTA the Panel has discretion to impose conditions under s 84.

22 FTA, sch 5 cl 17(1). 'Take into account' requires the decision maker to consider the matter (can be synonymous with "have regard to", ie give the matter genuine attention and thought). The question of weight is left to the decision maker (qualified here by the explicit requirement to give greater weight to the purpose of the FTA). See generally *Bleakley v Environmental Risk Management Authority* [2001] 3 NZLR 213 (HC) at [72]; and *New Zealand Transport Agency v Architectural Centre Inc* [2015] NZHC 1991, (2015) 19 ELRNZ 163 at [63].

b. The provisions of Parts 2,[23] 3, 6[24] and 8 to 10 of the RMA that direct decision making on an application for a resource consent; and

c. The relevant provisions of any other legislation that directs decision making under the RMA.

The purpose of the FTA must be given the greatest weight, ahead of all other considerations.[25] When considering the purpose of the FTA, the Panel must consider the extent of the Project's regional or national benefits.[26]

For the Tekapo PS application the relevant provisions of the RMA are sections 5–7, 87A, 104, 104A, 105, 107, 108–108A and 123. There is no other relevant legislation that directs decision making under the RMA.

Effect of Treaty settlement and other obligations on decision making

Section 82 of the FTA applies if a Treaty settlement, the Marine and Coastal Area (Takutai Moana) Act 2011 or the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019 is relevant to an approval. If a Treaty settlement or those Acts provide for the consideration of a document (such as a statutory document amended as a result of a Treaty settlement), the Panel must give it the same or equivalent effect through its decision making as it would under the relevant specified Act.

The Panel must also consider section 7 of the FTA in its decision making by acting in a manner that is consistent with the obligations in existing Treaty settlements and recognised customary rights. Section 82(3) requires the Panel to consider whether granting an approval would comply with section 7.[27]

The Marine and Coastal Area (Takutai Moana) Act 2011 and the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019 are not relevant to the Tekapo PS application.

The Ngāi Tahu settlement including the Ngāi Tahu Claims Settlement Act 1998 is discussed in sections 1.3, 4.2, 5.3, and 7.2.10 and Appendix A. The Tekapo PS is consistent with the Ngāi Tahu Treaty settlement.

---

[23] Excluding s 8, per sch 5 cl 17(2)(a) of the FTA.

[24] Excluding s 104D.

[25] FTA, sch 5 cl 17(1).

[26] FTA, s 81(4).

[27] For completeness, s 81(7) provides that nothing in ss 81, 82 or 85 limits s 7.

Limited grounds to decline

The Panel must decide whether to decline the approval.[28] The FTA prescribes limited grounds by which the Panel can decline to grant an approval.[29] Section 85 sets out when a panel *must* decline an approval, and where an approval *may* be declined (if the adverse impacts of that activity are considered to be out of proportion to the regional or national benefits of the proposal).

For the Tekapo PS application the Panel must decline an approval if one or more of the following matters apply:[30]

1. The approval is for an ineligible activity;[31] and/or

2. The Panel considers that granting an approval would breach section 7 of the FTA.[32]

As set out in section 1.5.8 of the AEE, The Tekapo PS application is not for an ineligible activity. Sections 1.3, 4.2, 5.3, and 7.2.10 and Appendix A. of the AEE discuss the Tekapo in the context of the Ngāi Tahu Treaty settlement.

The only ground on which the Panel has discretion to decline an approval is if, in making its decision,[33] it forms the view that:

a. There are one or more 'adverse impacts'[34] in relation to the approval sought;[35] and

b. Those adverse impacts are sufficiently significant to be out of proportion to the Project's regional or national benefits considered when giving weight to the FTA,[36] even after taking into account:[37]

    i. Any conditions that the Panel may set in relation to those adverse impacts; and

    ii. Any conditions or modifications that the applicant may agree to or propose to avoid, remedy, mitigate, offset, or compensate for those adverse impacts.

---

28 FTA, s 81(1)(b).

29 FTA, ss 81(2)(f), 85.

30 The requirements in ss 85(1)(c)-(h) and (2) do not apply to the Tekapo PS. The application is not for a change or cancellation of resource consent condition; certificate of compliance; concession; land exchange; access arrangement; mining permit; or coastal permit for aquaculture activities.

31 FTA, ss 5 and 85(1)(a).

32 FTA, ss 7 and 85(1)(b).

33 In accordance with s 81(2) of the FTA.

34 FTA, s 85(5). This term is broadly defined as meaning any matter *"considered by the panel in complying with section 81(2) that weighs against granting the approval"*.

35 FTA, s 85(3)(a).

36 In accordance with s 81(4) of the FTA.

37 FTA, s 85(3)(b).

Significantly, the above threshold cannot be met solely on the basis that an adverse impact is inconsistent with or contrary to a provision of a specified Act, or any other document that a panel must take into account or otherwise consider in making its decision.[38]

Conditions

Genesis' proposed conditions are set out in Appendix D of the application.[39] Drafts of plans referred to in the proposed consent conditions in Appendix D are included in Appendix E. When considering the application, the Panel must decide whether to grant any approvals and set any conditions to be imposed on those approvals.[40] If the Panel decides to impose conditions:

i. The Panel must take into account the provisions of Parts 6, 9 and 10 of the RMA, but give greater weight to the purpose of the FTA;[41] and

ii. The conditions must be no more onerous than necessary to address the purpose for which they are set.[42]

For the Tekapo PS application the broad powers to impose conditions for resource consents under ss 108–108A of the RMA are relevant to the Panel's powers to set conditions under the FTA. The following principles, with which the Panel will be familiar, are relevant. Valid conditions must:[43]

i. Be for a resource management purpose and not for any ulterior purpose;

ii. Fairly and reasonably relate to the proposal which is the subject of consent or designation (noting that section 108AA of the RMA requires a condition to be "directly connected" to an adverse effect of the activity on the environment and/or an applicable planning rule or environmental standard); and

iii. Not be so unreasonable that no reasonable decision maker could have imposed them.

As the Tekapo PS application is for a controlled activity and this application is under the FTA, the broad powers under the RMA are constrained:

---

38 FTA, s 85(4). The decision must be made in accordance with s 81(2) of the FTA.

39 As required by sch 5 cl 5(1)(k) of the FTA.

40 FTA, s 81(1)(a).

41 FTA, ss 81(2)(b) and (3)(a) and sch 5 cls 17(1) and 18.

42 FTA, ss 81(2)(d) and 83.

43 *Newbury District Council v Secretary of State for the Environment* [1980] 1 All ER 731 (HL) at 739, endorsed in the context of the RMA in *Housing NZ Ltd v Waitakere City Council* [2001] NZRMA 202 (CA) at [18].

a. Conditions can only be imposed for matters over which control has been reserved in national environmental standards, regulations or the Canterbury Land and Water Regional Plan;[44] and

b. As noted, under the FTA:[45]

   i. The conditions must be no more onerous than necessary to address the purpose for which they are set; and

   ii. The purpose of the FTA must be given greater weight.

Section 104(1)(ab) of the RMA explicitly applies to the Panel's decision making on resource consents.[46] Genesis' proposed conditions in Appendix D include conditions agreed with Te Rūnanga o Moeraki Incorporated, Te Rūnanga o Waihao Incorporated, Te Rūnanga o Arowhenua Society Incorporated and (with respect to indigenous biodiversity) the Department of Conservation.[47] As is the case under the RMA, the Panel cannot impose a requirement for offsetting or compensation without agreement from Genesis. The Panel cannot alter the indigenous biodiversity compensation conditions without Genesis' prior agreement. Conversely, the indigenous biodiversity compensation package may be altered (for example, by reducing funding) if mitigation conditions more onerous than the compensation package proposed are imposed.

For completeness, under the FTA the Panel has specific discretion to set conditions to recognise or protect a relevant Treaty settlement.[48] The Panel should not set any such conditions because Te Rūnanga o Moeraki Incorporated, Te Rūnanga o Waihao Incorporated and Te Rūnanga o Arowhenua Society Incorporated have agreed to the conditions before the Panel.

Assessment against criteria

The Tekapo PS application satisfies the relevant tests under the FTA and accords with the purpose of the FTA as set out in section 1.2. The Panel can be satisfied that the resource consents can be granted on the conditions proposed.

1.5.3 Pre-lodgement Requirements for Listed Projects

Section 29(1) of the FTA states:

---

44 RMA, s 104A(b).

45 FTA, ss 81(2)(d), 83 and sch 5 cls 17(1) and 18.

46 FTA, ss 81(2)(b) and (3)(a) and sch 5 cls 17(1) and 18. Imposing compensation or offsetting not proposed or agreed to, or altering conditions proposed by Genesis, would not help facilitate delivery of the project and would likely be more onerous than necessary.

47 For example, draft Schedule One General Conditions 26 – 37.

48 FTA, ss 81(2)(e) and 84.

Before lodging a substantive application for a listed project, the authorised person for the project must—

(a) consult the persons and groups referred to in section 11;

The persons and groups referred to in section 11 of the FTA and the consultation undertaken by Genesis (being the "authorised person" for the Tekapo PS) are set out in **Table 1.**

Table 1: Persons and Groups Consulted

Section 11 Person or Group	Specific Group	Consultation
Relevant local authorities	Canterbury Regional Council	Genesis met with CRC on 5 February 2025 to discuss the intention use the RTA process and the implications of that for the resource consent applications previously lodged with the Council. Further meetings took place with CRC on 18 February, 3 March, 24 March, 31 March and 7 April to discuss the FTA application and proposed consent conditions. CRC comments on the draft consent conditions are discussed in section 6.11 of this assessment. Genesis has also considered and incorporated (where appropriate) matters previously raised by CRC in their s92 request into this FTA application.
	Mackenzie District Council	The Council has provided a letter (Appendix U) thanking Genesis for the update regarding Genesis' decision to proceed with Tekapo PS reconsenting through the Fast-Track process, acknowledging the change in consenting pathway and expressing appreciation for continued engagement.

Section 11 Person or Group	Specific Group	Consultation
Relevant iwi authorities, hapū, and Treaty settlement entities	Te Rūnanga o Ngāi Tahu Te Rūnanga o Arowhenua Te Rūnanga o Waihao Te Rūnanga o Moeraki	While agreement has been reached with the Rūnaka for the resource consent applications to CRC for reconsenting the Tekapo PS, Genesis also approached the Rūnaka with respect to the FTA application. This included obtaining confirmation from the Rūnaka that they had no specific concerns regarding the project being included as a Schedule 2 project in the FTA. Subsequent discussion with the Rūnaka confirmed that contact should be made via their legal counsel. An initial meeting with counsel took place on 7 March, with subsequent meetings and correspondence regarding the proposed application and consent conditions.
Relevant administering agencies	Environmental Protection Authority	Genesis confirmed with the EPA that a FTA application was in preparation (see below).
	Ministry for the Environment	Genesis confirmed with MFE that a FTA application was in preparation (see below).

For the RMA applications, Te Rūnanga o Ngāi Tahu (being the relevant Treaty settlement entity for the Ngāi Tahu Claims Settlement Act 1998) confirmed that the Charter of Te Rūnanga o Ngāi Tahu constitutes Te Rūnanga as kaitiaki of the collective tribal interests. Te Rūnanga is responsible for managing, advocating for and protecting the rights and interests inherently held by Ngāi Tahu whānui as mana whenua and that it accepts and respects the right of Papatipu Rūnanga to make their own responses as representatives of man whenua. On this basis, and in relation to the renewal of resource consents by Genesis, Te Rūnanga supported Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki in relation to this matter, with their support of the applications to

also be regarded as being the position of Te Rūnanga.[49] Te Rūnanga o Ngāi Tahu have subsequently confirmed this position with respect to FTA application.[50]

The consultation undertaken for the resource consent applications for reconsenting the Tekapo PS has resulted in:[51]

1. Refinements to the technical assessments undertaken.

2. Comprehensive agreements being reached with several parties, including those directly affected by the Tekapo PS.

3. Preparation of proposed consent conditions (see Appendix D) that not only address the effects of the Tekapo PS, the operational requirements for the Tekapo PS and the matters of interest to the parties consulted.

As the local authority relevant to the consents being sought, Genesis consulted with CRC in relation to this substantive application. CRC provided comments on the technical reports (as part of the CRC application process) and proposed conditions. Modifications to the assessments and proposed conditions in response to the discussions with and comments from CRC have been included with this application.

While no consent is sought from MDC, Genesis has consulted the Council. MDC has provided a letter (Appendix U) thanking Genesis for the update regarding Genesis' decision to proceed with Tekapo PS reconsenting through the Fast-Track process, acknowledging the change in consenting pathway and expressing appreciation for continued engagement.

Ngāi Tahu along with the Waitaki Rūnaka are the relevant "iwi authorities and groups" that represent hapū and represent mana whenua for the project area. Agreements in support of the application have been reached with the relevant Rūnaka (Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki, with the support of Te Rūnanga o Ngāi Tahu) and consent conditions have been included as appropriate in respect of those agreements.

There are no customary marine titles under the Marine and Coastal Area (Takutai Moana) Act 2011 relevant to the project and the project area is not within or adjacent to, nor would it directly affect, ngā rohe moana o ngā hapū o Ngāti Porou.

Genesis confirmed to the Environmental Protection Authority Fast-track team on 18 February that a substantive application for a listed project under the Fast-track Approvals

---

[49] See Te Rūnanga o Ngāi Tahu letter to Canterbury Regional Council dated 19 June 2023, copy in Appendix B.

[50] See Te Rūnanga o Ngāi Tahu letter to Genesis dated 27 March 2025, copy in Appendix B.

[51] FTA section 13(4)(k).

Act, to "continue to use, operate, and maintain the power scheme comprising Tekapo A Power Station and substation, Tekapo B Power Station and substation, and the canal system, and connect and supply electricity to the national grid" as listed in Schedule 2 of the FTA was being prepared. The advice noted that the application would seek the status quo operation of the Tekapo Power Scheme for the next 35 years, including existing flow regimes and lake level operations.

Following further discussion with the Fast-track team, Genesis established a link to the Fast-track application portal as advised by the Fast-track team. No further consultation was considered necessary or undertaken.

Genesis approached the Ministry for the Environment on 18 February to confirm that a substantive application would be lodged for a listed project under the FTA, to "continue to use, operate, and maintain the power scheme comprising Tekapo A Power Station and substation, Tekapo B Power Station and substation, and the canal system, and connect and supply electricity to the national grid" as listed in Schedule 2 of the FTA and sought consultation regarding the application.

The Ministry advised on 24 March that it is the "relevant administering agency" for approvals relating to the RMA under the FTA in respect of the "Tekapo Power Scheme" project. The Ministry confirmed that, an assessment of the project against "*any relevant national policy statement, national environmental standards and if relevant the New Zealand Coastal Policy Statement*" would need to be provided as part of the substantive application and provided a summary of the national direction made under the RMA, for consideration. The response to the national policy direction provided in the Ministry advice is presented in **Table 2** (National Policy Statements) and **Table 3** (National Environmental Standards.

Table 2: Applicable National Policy Statements.

National Policy Statement	Description	Relevance to Tekapo PS Applications
National Policy Statement for Greenhouse Gas Emissions from Industrial Process Heat 2023	This NPS provides nationally consistent policies and requirements for reducing greenhouse gas emissions from industries using process heat. It works alongside the National Environmental Standards for Greenhouse Gases from Industrial Process.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and do not involve greenhouse gas emissions from industrial process heat. This NPS is not applicable to the Tekapo PS applications.
National Policy Statement for Highly Productive Land 2022	This NPS provides national direction to improve the way highly productive land is managed under the RMA. The objective is to ensure the availability of New Zealand's most favourable soils for food and fibre production. National	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and no highly productive land will be affected. This NPS is not applicable to the Tekapo PS applications.

National Policy Statement	Description	Relevance to Tekapo PS Applications
	Policy Statement for Freshwater Management 2020 This NPS provides local authorities with updated national direction on how they should manage freshwater under the RMA.	
National Policy Statement for Freshwater Management 2020	This NPS provides local authorities with updated national direction on how they should manage freshwater under the RMA.	The applications are for dam take, use and discharge consents for existing activities. A full assessment of the implications of this NES for the Tekapo PS applications is included in section 7.2.6.2 of this assessment.
National Policy Statement for Indigenous Biodiversity 2023	This NPS provides direction to local authorities to protect, maintain and restore indigenous biodiversity requiring at least no further reduction in indigenous biodiversity nationally.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities. Clause 1.3(3) of the NPS states that nothing in the NPS "*applies to the development, operation, maintenance or upgrade of renewable electricity generation assets and activities*". As the consents sought are for the maintenance and operation of renewable electricity generation assets and activities (the Tekapo PS), the NPS is not applicable to the Tekapo PS applications.
National Policy Statement for Renewable Electricity Generation 2011	This NPS provides guidance for local authorities on how renewable electricity generation should be dealt with in RMA planning documents.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities. A full assessment of the implications of this NPS for the Tekapo PS applications is included in in section 7.2.6.1 of this assessment.
National Policy Statement on Electricity Transmission	This NPS sets out the objective and policies for managing the electricity transmission network. National Policy Statement on Urban Development 2020 This NPS recognises the national significance of well-functioning urban environments. It removes barriers to development to allow growth in locations that have good access to existing services, public transport networks and infrastructure.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and no changes to transmission are proposed. This NPS is not applicable to the Tekapo PS applications.
National Policy Statement on Urban Development 2020	This NPS recognises the national significance of well-functioning urban environments. It removes barriers to development to allow growth in locations that have good access to existing services, public transport networks and infrastructure.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and no changes to urban environments are proposed. This NPS is not applicable to the Tekapo PS applications.

National Policy Statement	Description	Relevance to Tekapo PS Applications
New Zealand Coastal Policy Statement 2010	The NZCPS provides guidance for local authorities in their day-to-day management of the coastal environment. The NZCPS is the only compulsory NPS under the RMA.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and do not affect the coastal environment. This NPS is not applicable to the Tekapo PS applications.

Table 3: Applicable National Environmental Standards.

National Environmental Standards (NES)	Description	Relevance to Tekapo PS Application
National Environmental Standards for Air Quality	This NES prohibits discharges from certain activities and set a guaranteed minimum standard for air quality for people living in New Zealand.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and do not involve discharges to air. This NES is not applicable to the Tekapo PS applications.
National Environmental Standards for Commercial Forestry	This NES provides nationally consistent regulations to manage the environmental effects of forestry. National Environmental Standards for Electricity Transmission Activities This NES sets out which electricity transmission activities are permitted, subject to conditions to control environmental effects. They apply only to existing high voltage electricity transmission lines.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and do not involve commercial forestry activities. This NES is not applicable to the Tekapo PS applications.
National Environmental Standards for Electricity Transmission Activities	This NES sets out which electricity transmission activities are permitted, subject to conditions to control environmental effects. They apply only to existing high voltage electricity transmission lines.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and no changes to transmission are proposed. This NES is not applicable to the Tekapo PS applications.
National Environmental Standards for Freshwater	This NES regulates activities that pose risks to the health of freshwater and freshwater ecosystems. National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat This NES sets out nationally consistent rules for certain greenhouse gas emitting activities from industrial process heat.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities. A full assessment of the implication of this NES for the Tekapo PS applications is included in section 7.2.5.1 of this assessment.
National Environmental Standards for Greenhouse Gas	This NES sets out nationally consistent rules for certain greenhouse gas emitting	The applications are for dam take, use and discharge consents for existing renewable electricity

National Environmental Standards (NES)	Description	Relevance to Tekapo PS Application
Emissions from Industrial Process Heat	activities from industrial process heat.	generation activities and does not involve any greenhouse gas emitting activities from industrial process heat. This NES is not applicable to the Tekapo PS applications.
National Environmental Standards for Marine Aquaculture	This NES replaces regional council rules for existing marine farms and provides a more certain and efficient process for replacing consents, realigning farms and changing farmed species. In some instances, they allow regional council rules to remain in force.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and does not involve any marine aquaculture activities. This NES is not applicable to the Tekapo PS applications.
National Environmental Standards for Sources of Human Drinking Water	This NES sets requirements to protect sources of human drinking water from becoming contaminated.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities. A full assessment of the implications of this NES for the Tekapo PS applications is included in section 7.2.5.2 of this assessment.
National Environmental Standards for Storing Tyres Outdoors	This NES provides nationally consistent rules for the responsible storage of tyres.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and does not involve outdoor storage of tyres. This NES is not applicable to the Tekapo PS applications.
National Environmental Standards for Telecommunication Facilities	This NES sets national rules regarding the deployment of telecommunications infrastructure across New Zealand.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and is not a telecommunication facility. This NES is not applicable to the Tekapo PS applications.
National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health	This NES includes requirements for assessing and managing potentially contaminated soil.	The applications are for dam take, use and discharge consents for existing renewable electricity generation activities and do not any disturbance of soil. This NES is not applicable to the Tekapo PS applications.

While not referred to in the Ministry for the Environment advice, an assessment of the implications of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 is provided in section 7.2.5.3 of this assessment.

The Ministry consultation has confirmed the nature of the national directions relating to the Tekapo PS reconsenting project.

The project does not require an approval for land exchange.

1.5.4 Identification of Existing Resource Consent for Same Activity

Section 30 of the FTA sets out the requirements relating to activities where the "*authorised person for the project does not hold an existing resource consent for the same activity using some or all of the same natural resource*" (s30(1)(b)).

Genesis holds resource consents for the same activity (the Tekapo PS consents) but no other person holds resource consents for the same activity using the same natural resource, so section 30 does not apply.

1.5.5 Project Priority

Genesis has not sought priority under section 38 of the FTA.

1.5.6 Substantive Application for Approval

Section 42 of the FTA sets out the requirements for lodging applications for approvals under the Act. Section 42(3)(a) requires that an applicant for an approval must be eligible to apply for any corresponding approval under a specified Act. For this application, Genesis is eligible to apply for a resource consent that would otherwise be applied for under the RMA.

Section 42(2)(a) requires that an application must comply with section 43 of the FTA. This is discussed in **section 1.5.7** below.

1.5.7 Requirements for a Substantive Application

The requirements identified in section 43 of the FTA for a substantive application and how those matters are addressed in this application are summarised in **Table 4** below.

Table 4: Requirements for a Substantive Application

Section	Requirement	Comment
43(1)(a)	Must be lodged in the form and manner approved by the EPA	The relevant EPA form (Tekapo-PS-Fast-track-substantive-application-form-11 April 2025) has been lodged via the Fast-track approvals web site.
43(1)(b)	Explanation of how the project to which the application relates is consistent with the purpose of this Act.	The Tekapo PS is listed in Schedule 2 (page 102) of the FTA. Section 1.2 of this report summarises how the Tekapo PS applications are consistent with the purpose of this Act.

Section	Requirement	Comment
43(1)(c)	Demonstrate that the project does not involve any ineligible activities.	The applications are for replacement resource consents to continue to use, operate, and maintain the Tekapo PS comprising Tekapo A Power Station and substation, Tekapo B Power Station and substation, and the related canal system, between Takapō (higher elevation), to the northeast near Tekapo, and Lake Pūkaki (lower elevation), as specified in Schedule 2 of the FTA.
43(1)(d)	More than 1 authorised person	Not applicable, Genesis is the applicant and authorised person.
43(1)(e)(i)	Information requirements specified by the Minister under section 27(3)(b)(ii).	No information requirements have been specified under section 27(3)(b)(ii).
43(1)(e)(ii)	The requirements listed in subsection (3) that apply to the approvals sought.	See comment for section 43(3) below.
43(1)(f)	Section 39 determination under section 23 or 24.	A Section 39 determination under section 23 or 24 is not required for the project.
43(1)(g)	Steps taken to secure the agreement referred to in section 5(1)(a).	Not applicable, no determination is required under section 23 or 24 for the project.
43(1)(h)	Does the application relate to a priority project and, if so, confirm that, to the best of the applicant's knowledge, there are no competing applications.	The application does not relate to a priority project.
43(1)(i)	Has the application been made by the deadline specified in the notice under section 28(3)(d).	Tekapo PS reconsenting is a project listed in Schedule 2, there is no deadline notice under section 28(3)(d).
43(1)(j)	Has the relevant fee, charge, or levy payable under regulations in respect of the application been paid?	Genesis has paid the relevant fee.
43(2)	Information required by section 13(4) and section 29.	A description of the project and the activities it involves, including a map of the project area, along with the other

Section	Requirement	Comment
		information required by section 13(4) and section 29 is provided in this document.
43(3)(a)	The requirements in clauses 5 to 8 of Schedule 5.	A description of the project and the activities it involves, including a map of the project area, along with the other information required by clauses 5 to 8 of Schedule 5 is provided in this document.
43(3)(b)	The requirements in clause 10 of Schedule 5 for a change or cancellation of a resource consent condition.	Not applicable, no change or cancellation of a resource consent condition is sought.
43(3)(c)	The requirements in clause 11 of Schedule 5 for a compliance certificate.	Not applicable, a compliance certificate relating to the Tekapo PS is not sought.
43(3)(d)	The requirements in clause 12 of Schedule 5 for a designation.	Not applicable, a designation relating to the Tekapo PS is not sought.
43(3)(e)-(m)	Requirements relating to approval for a concession, land exchange, conservation covenant, wildlife approval, archaeological authority, complex freshwater fisheries activity, marine consent, access arrangement or mining permit.	Not applicable, approvals for these activities are not being sought.

1.5.8 Project Eligibility

Section 43(1)(c) "Requirements for substantive application" states that an application must demonstrate that the project does not involve any ineligible activities.

The resource consents sought for the Tekapo PS do not involve any of the activities described in a – n of section 5(1) of the FTA. The application therefore does not involve any ineligible activity.

1.5.9 Exercise of Existing Approval While Applying for Approval

Section 94 of the FTA applies where an authorised person who holds an existing approval lodges a substantive application that seeks an approval under the Act that corresponds to, and is for the activity to which, the existing approval applies.

Genesis holds resource consents for the use, operation and maintenance of the Tekapo PS that expire on 30 April 2025. Applications have previously been made to and

accepted by the CRC for the consents required for the ongoing operation of the Tekapo PS. Those applications will be withdrawn on confirmation of acceptance of this application under the FTA.

The existing consents are an existing approval that is a "*right under section 124(3) … of the Resource Management Act 1991*" (section 95(a)(b)) that enables the Tekapo PS to continue operating under the existing resource consents.

Section 95(2) states that the existing approval is treated as remaining in force until the later of the following:

(a) The date on which any rights of appeal under section 99 that relate to the approval referred to in subsection (1)(a) have been exhausted or have expired; or

(b) The date on which the existing approval expires or is surrendered in accordance with this Act or the relevant specified Act.

Genesis can therefore continue to operate the Tekapo PS under the existing resource consents until this application under the FTA is finalised.

1.5.10 Schedule 5 Requirements

Section 43(3)(a) of the FTA states that requirements for a substantive application under the Act for a resource consent are set out in clauses 5 to 8 of Schedule 5.

The application is not for a subdivision or reclamation, so information is not required under clause 8 (information required in application for subdivision or reclamation) of Schedule 5.

The application is not for activities that involve the construction of any new culvert, ford, dam or diversion structure or for works involving a disturbance to a water body. Information is therefore not required under clause 9 (information required in application including standard freshwater fisheries activity) of Schedule 5 or Schedule 9 (Approvals relating to complex freshwater fisheries activities).

The application is not for a change or cancellation of conditions or for a certificate of compliance. The information specified in clause 10 (information required in application for change or cancellation of condition) or clause 11 (information required in application for certificate of compliance) of Schedule 5 is therefore not required for this application. The application does not involve a notice of requirement for a designation so the information specified under clause 12 of Schedule 5 (information required in notice of requirement) is not required for this application.

The requirements of clauses 5 to 7 of Schedule 5 are summarised in the following tables.

Table 5: Clause 5 Information Required in Consent Application

Clause 5 Information Requirement	Comment
(1) For the purposes of section 43(3)(a), a consent application must include the following information:	
(a) a description of the proposed activity;	A description of the Tekapo PS and the resource consents being sought is set out in sections 1 to 3 in the document "Genesis Energy Limited, Tekapo Power Scheme, Fast-track Applications for Resource Consent and Assessment of Environmental Effects" dated April 2025 (referred to as the "**AEE**").
(b) a description and map of the site at which the activity is to occur, including whether the site is within or adjacent to— (i) a statutory area (as defined in the relevant Treaty settlement Act); or (ii) ngā rohe moana o ngā hapū o Ngāti Porou; or (iii) a protected customary rights area under the Marine and Coastal Area (Takutai Moana) Act 2011	A description and map of the Tekapo PS is provided in Figure 1 of this AEE. There are Statutory Acknowledgements under the Ngāi Tahu Claims Settlement Act 1998 (Figure 2) relevant to the Tekapo PS as follows: 1. Schedule 57: Statutory acknowledgement for Takapō (Lake Tekapo); 2. Schedule 34: Statutory acknowledgement for Lake Pūkaki; and 3.. Schedule 72: Statutory acknowledgement for Waitaki River (to the extent that the Waitaki River is downstream of the Tekapo PS).
(c) confirmation that the consent application complies with: (i) Section 46(2)(a)	The Tekapo PS complies with section 46(2)(a) as discussed in sections 1.5.6, 1.5.7, 1.5.8, 1.5.10 and 1.5.12 of this document. It is an application for a listed project (s42(1), it complies with section 43 (s42(2) and Genesis is eligible to apply for a resource consent that would otherwise be applied for under the RMA (s42(3) and (4).
(ii) Section 46(2)(b)	The Tekapo PS applications are a listed project under Schedule 2 of the FTA (page 102).
(iii) Section 46(2)(d)	The relevant fee payable under the Fast-track Approvals (Cost Recovery) Regulations 2025 for the application has been paid.
(d) the full name and address of— (i) each owner of the site and of land adjacent to the site; and (ii) each occupier of the site and of land adjacent to the site whom the applicant is unable to identify after reasonable inquiry	The names and addresses of owners of the Tekapo PS and land adjacent to the site and of occupiers of land adjacent to the site (identified after reasonable inquiry and as far as is reasonably practicable) are set out in Appendix C.
(e) a description of any other activities that are part of the proposal to which the consent application relates	The description of the activity for which consent is sought as set out in the document "Genesis Energy Limited, Tekapo Power Scheme, Fast-track Applications for Resource Consent and Assessment of Environmental Effects" dated April 2025 describes the Tekapo PS activities for which consent is sought.
(f) a description of any other resource consents, notices of requirement for designations, or alterations to designations required for the project to which the consent application relates	No other resource consents, notices of requirement for designations, or alterations to designations are required for the Tekapo PS.
(g) an assessment of the activity against sections 5, 6, and 7 of the Resource Management Act 1991	An assessment of the activity against sections 5, 6, and 7 of the RMA is presented in section 7.3 of this AEE.
(h) an assessment of the activity against any relevant provisions in any of the documents listed in subclause (2)	An assessment of the activity against relevant provisions in the documents listed in subclause (2) is presented in section 7.3 of sections 7.2.5, 7.2.6, 7.2.7, 7.2.8 and 7.2.9 and 7.2.10 and in Appendix T in this AEE (see subclause (2) below).

Clause 5 Information Requirement	Comment
(i) information about any Treaty settlements that apply in the area covered by the consent application, including— (i) identification of the relevant provisions in those Treaty settlements; and (ii) a summary of any redress provided by those settlements that affects natural and physical resources relevant to the project or project area	Kāi Tahu signed a Deed of Settlement for its historic claims against the Crown at Kaikoura on 21 November 1997, and the Ngāi Tahu Claims Settlement Act was passed on 29 September 1998. The Ngāi Tahu Claims Settlement Act 1998 includes an apology by the Crown to Ngāi Tahu alongside provision for a wide range of matters such as: 1. The vesting of Aoraki/Mount Cook in Te Rūnanga o Ngāi Tahu; 2. The transfer and vesting of a range of settlement properties; 3. The transfer of various farm assets and forestry assets; 4. The vesting of tribal properties in Te Rūnanga o Ngāi Tahu; 5. The creation of historic reserves; 6. Changes of names and classifications; 7. A range of Statutory acknowledgements; 8. The creation and granting of nohoanga entitlements; 9. Acknowledgement of special associations with taonga species and the management of all taonga species; 9. The acknowledgement of the special association with taonga fish species and management of customary fisheries; and 10. Provision for mahinga kai, including the customary gathering of food and natural materials and the places where those resources are gathered. Kāi Tahu has a long history of active engagement with the Waitaki catchment spanning over eight centuries. The Waitaki Catchment remains of paramount importance to Kāi Tahu. As Manawhenua, the members belonging to the three Papatipu Rūnanga, Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki have a responsibility to assess how the Tekapo Power Scheme impacts their rights, values and practices. These matters are discussed in the document "Treaty Impact Assessment: The Tekapo and Waitaki Power Schemes. An assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd", July 2023, included as Appendix A in this document.
(j) a list of any relevant customary marine title groups, protected customary rights groups, ngā hapū o Ngāti Porou (where an application is within, adjacent to or directly affecting ngā rohe moana o ngā hapū o Ngāti Porou), or applicants under the Marine and Coastal Area (Takutai Moana) Act 2011	The relevant mana whenua for the Tekapo PS applications are Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki.
(k) the conditions that the applicant proposes for the resource consent	Conditions proposed for the resource consents sought for the Tekapo PS are included as Appendix D in this document. These conditions have been provided to and discussed with Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua and CRC staff.
(l) if a notice under section 30(3)(b) or (5) has been received,— (i) a copy of that notice showing that it was received within the time frame specified in section 30(6)(b); and (ii) if a notice has been received under section 30(5), any more up-to-date information that the applicant is aware of about the existing resource consent referred to in the notice.	Section 30 does not apply as Genesis holds existing resource consents for the same activity using some or all of the same natural resource. No notices under section 30 have been received.
(2) The documents referred to in subclause (1)(h) are the following:	

Clause 5 Information Requirement	Comment
(a) a national environmental standard:	These matters are discussed in section 7.2.5 in this document.
(b) other regulations made under the Resource Management Act 1991:	These matters are discussed in section 7.2.5 in this document.
(c) a national policy statement:	These matters are discussed in section 7.2.6 in this document.
(d) a New Zealand coastal policy statement:	The New Zealand coastal policy statement is not relevant to the Tekapo PS applications.
(e) a regional policy statement or proposed regional policy statement:	These matters are discussed in section 7.2.7 and Appendix T in this document.
(f) a plan or proposed plan:	These matters are discussed in sections 7.2.8 (Waitaki Catchment Water Allocation Regional Plan) and 7.2.9 (Canterbury Land and Water Regional Plan) and in Appendix T in this document.
(g) a planning document recognised by a relevant iwi authority and lodged with a local authority.	These matters are discussed in section 7.2.10 in this document.
(3) An assessment under subclause (1)(h) must include an assessment of the activity against— (a) any relevant objectives, policies, or rules in a document listed in subclause (2); and (b) any requirement, condition, or permission in any rules in any of those documents; and (c) any other requirements in any of those documents.	These matters are discussed in sections 7.2.5, 7.2.6, 7.2.7, 7.2.8, 7.2.9 and 7.2.10 in this document.
(4) A consent application must include an assessment of the activity's effects on the environment that— (a) includes the information required by clause 6; and (b) covers the matters specified in clause 7.	See **Table 6** for discussion of the requirements in clause 6. See **Table 7** for discussion of the requirements in clause 7.
(5) A consent application must also include the following information:	
(a) if a permitted activity is part of the proposal to which the consent application relates, a description that demonstrates that the activity complies with the requirements, conditions, and permissions for the permitted activity (so that a resource consent is not required for that activity under section 87A(1) of the Resource Management Act 1991); and	The resource consent applications for the Tekapo PS relate to activities not otherwise permitted by rules in the relevant plans or by other existing resource consents. Information relating to permitted activities relevant to the Tekapo PS is included in section 3.2.2.1 of this document.
(b) if the activity is to occur in an area that is within the scope of a planning document prepared by a customary marine title group under section 85 of the Marine and Coastal Area (Takutai Moana) Act 2011 or the environmental covenant prepared by ngā hapū o Ngāti Porou under section 19 of the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019, an assessment of the activity against any resource management matters set out in that document; and	The Tekapo PS is not within an area that is within the scope of a planning document prepared by a customary marine title group under section 85 of the Marine and Coastal Area (Takutai Moana) Act 2011 or the environmental covenant prepared by ngā hapū o Ngāti Porou under section 19 of the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019.
(c) if the activity is to occur in an area that is a taiāpure-local fishery, a mātaitai reserve, or an area that is subject to bylaws made under Part 9 of the Fisheries Act 1996, an assessment of the effects of the activity on the use or management of the area.	These matters are addressed in section 5 of this document and in the document "Treaty Impact Assessment: The Tekapo and Waitaki Power Schemes. An assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd", July 2023, included as Appendix A in this document.
(6) If the applicant is not able to supply the name and address of the owner and each occupier of the site and of land adjacent to the site because the land is Māori land in multiple ownership, the applicant must include a statement to that effect.	Not applicable.

Clause 5 Information Requirement	Comment
(7) If the substantive application is to be lodged by more than 1 authorised person, the references to the applicant in subclauses (1)(d), (k), (l) and (6) must be read as references to the authorised person who is to be identified in the application as the proposed holder of the resource consent.	Not applicable.

Table 6: Clause 6 Information required to assess environmental effects

Clause 6 Information Requirement	Comment
(1) The assessment of an activity's effects on the environment under clause 5(4) must include the following information:	
(a) an assessment of the actual or potential effects on the environment:	An assessment of the actual or potential effects on the environment is set out in the document "Genesis Energy Limited, Tekapo Power Scheme, Fast-track Applications for Resource Consent and Assessment of Environmental Effects" dated April 2025, particularly in section 5 and the relevant technical appendices to this AEE.
(b) if the activity includes the use of hazardous installations, an assessment of any risks to the environment that are likely to arise from such use:	The Tekapo PS is not identified as a hazardous facility in the WorkSafe New Zealand Major Hazard Facilities – Public Information register.
(c) if the activity includes the discharge of any contaminant, a description of— (i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and (ii) any possible alternative methods of discharge, including discharge into any other receiving environment:	The Tekapo PS applications include an application to discharge water and associated contaminants associated with the operation of the Tekapo PS. The "associated contaminants" include sediment entrained in water taken for the scheme operation. A separate resource consent (CRC220340) is held for the discharge of stormwater associated with the Tekapo PS. This consent expires in October 2056 and requires a Stormwater Management and Monitoring Plan that: a. Identifies all contaminant risks to the stormwater system and how each of these risks are to be minimised and managed; b. Describes the infrastructure used to contain spills; and c. Identifies and quantifies all chemicals and hazardous substances, including fuels and oils, held on the site, and the methods used to avoid their accidental discharge to the stormwater system (e.g. bunding, diversion to wastewater system, procedures).
(d) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect of the activity:	These matters are discussed in sections 2.11 and 6 in this AEE.
(e) identification of persons who may be affected by the activity and any response to the views of any persons consulted, including the views of iwi or hapū that have been consulted in relation to the proposal:	These matters are discussed in sections 1.5.11 and 8 in this AEE.
(f) if iwi or hapū elect not to respond when consulted on the proposal, any reasons that they have specified for that decision:	Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki have provided the document "Treaty Impact Assessment: The Tekapo and Waitaki Power Schemes. An assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd", July 2023, included as Appendix A in this AEE.
(g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how the effects will be monitored and by whom, if the activity is approved:	These matters are discussed in section 6 in this AEE.

Clause 6 Information Requirement	Comment
(h) an assessment of any effects of the activity on the exercise of a protected customary right.	Please see the Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki report "Treaty Impact Assessment: The Tekapo and Waitaki Power Schemes. An assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd", July 2023, included as Appendix A in this AEE.
(2) A consent application need not include any additional information specified in a relevant policy statement or plan that would be required in an assessment of environmental effects under clause 6(2) or 7(2) of Schedule 4 of the Resource Management Act 1991.	This AEE includes information relevant to the application for resource consents for the Tekapo PS.

Table 7: Clause 7 Matters to be covered in assessment of environmental effects

Clause 7 Information Requirements	Comment
The assessment of an activity's effects on the environment under clause 5(4) must cover the following matters:	An assessment of the actual or potential effects on the environment is set out in the document "Genesis Energy Limited, Tekapo Power Scheme, Fast-track Applications for Resource Consent and Assessment of Environmental Effects" dated April 2025, particularly in section 5 and the relevant technical appendices to this AEE.
(a) any effect on the people in the neighbourhood and, if relevant, the wider community, including any social, economic, or cultural effects:	An assessment of the actual or potential effects on the wider community, including any social, economic, or cultural effects is set out in section 5 and the relevant technical appendices to this AEE.
(b) any physical effect on the locality, including landscape and visual effects:	An assessment of the actual or potential landscape and visual effects is set out in section 5 and the relevant technical appendices to this AEE.
(c) any effect on ecosystems, including effects on plants or animals and physical disturbance of habitats in the vicinity:	An assessment of the actual or potential effects on plants or animals and physical disturbance of habitats is set out in section 5 and the relevant technical appendices to this AEE.
(d) any effect on natural and physical resources that have aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:	An assessment of the actual or potential effects on natural and physical resources is set out in section 5 and the relevant technical appendices to this AEE.
(e) any discharge of contaminants into the environment and options for the treatment and disposal of contaminants:	An assessment of the actual or potential of discharge for which consent is sought is set out in section 5 and the relevant technical appendices to this AEE.
(f) any unreasonable emission of noise:	The resource consents sought for the Tekapo PS do not result in any unreasonable emission of noise.
(g) any risk to the neighbourhood, the wider community, or the environment through natural hazards or hazardous installations.	The operation of the Tekapo PS mitigates some adverse flood effects in the Takapō / Waitaki River catchments by enabling retention of water in Takapō and management of flood flows through the power scheme facilities. The District Plan includes hydroelectricity inundation hazard area maps which shows the locations adjacent to Tekapo PS infrastructure that are identified as being potential subject to inundation in the event of a dam or canal breach.

1.5.11 Comments on a Substantive Application

A core tenet of the FTA is the avoidance of wider (indirect) participation of other parties in the process. Under the FTA the requirements for "persons affected"[52] to be included in the substantive application is those who the applicant considers are "likely to be affected" with a limited list of inclusive examples. In the same manner the Panel's ability to seek comments is also limited, subject to the Panel being able to include any other person it considers appropriate.[53] When considering appropriateness, the Panel must assess the matters below bearing in mind the purpose and intent of the FTA.

The ability for persons and groups to participate in the process under the FTA is purposefully more limited compared to the RMA or the COVID-19 Recovery (Fast-track Consenting) Act 2020 (**COVID Fast-track Act**). Unlike the RMA, limited or public notification is not permitted under the FTA. Parliament also specifically excluded groups who were invited to comment under the COVID Fast-track Act.[54] The policy intent is for specific persons and groups that are directly affected (such that they have a particular and explicit interest in the project), to be invited to comment, not to seek comments from the broader public.[55]

In rejecting a proposal during Committee of the Whole House to require public notification, the Minister for Regional Development, the Hon Shane Jones, stated that a key tenet of the FTA is that:[56]

> *... those who have an entitlement to be integrally involved in the consideration of the panel in granting approval of those that are most affected by the approval, it is not a wide, vague description of who may or may not feel that they are affected by what externalities might flow from the project. This is the whole key point of the bill. So, for those reasons, obviously, we are not going to accept that submission or that proposed amendment. This bill will allow the people to be consulted, providing they represent that circle of interests that are genuinely and most impacted by the decision.*

---

52 Fast-track Approvals Act 2024, ss 13(4)(j) and 43(2).

53 Fast-track Approvals Act 2024, s 53(3).

54 (10 December 2024) 780 NZPD (Fast-track Approvals Bill — In Committee—Part 2 (continued), Rachel Brooking and Chris Bishop).

55 Environment Committee *Fast-track Approvals Bill* (18 October 2024) at 15. Ministry for the Environment *Departmental Report on the Fast-track Approvals Bill – Version 2* (21 October 2024) at [779] and [782].

56 (10 December 2024) 780 NZPD (Fast-track Approvals Bill — In Committee—Part 2 (continued), Lan Pham and Shane Jones).

The Minister responsible for RMA Reform, the Hon Chris Bishop, made a similar point earlier in the debate:[57]

> *... It is true that there are fewer participation rights and less ability than in the past as per the Resource Management Act, for example, but that is precisely the point. That is one of the purposes of the bill. That is why the bill has been drafted the way it is. ...*

Appendix C identifies landowners and land adjacent to the Tekapo PS "Core Land", being land and infrastructure owned by Genesis, including the Lake Tekapo Intake Structure, Gate 16, Lake George Scott, Gate 17, Tekapo A Power Station, the Tekapo Canal and the Tekapo B Power Station. Genesis has identified the following as falling within section 13(4)(j) of the FTA:[58]

- 12 owners and occupiers of the land to which the substantive application relates or the land adjacent to that land;[59]
- The New Zealand Transport Agency, which has a designation on land to which the substantive application relates;[60]
- Transpower New Zealand Limited ("**Transpower**");[61] and
- Te Rūnanga o Ngāi Tahu, Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki.[62]

Genesis considers the Panel should invite comments from the above under section 53(2) and (3) of the FTA. Genesis does not consider there are any other parties for which it would be "appropriate" for the Panel to invite comments from when the clear intent and purpose of the FTA is considered.

For completeness, it is noted as set out in section 8 of this AEE that Genesis has entered into agreements with the following:

1. Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki;
2. The Department of Conservation;
3. The Central South Island Fish and Game Council;

---

[57] (10 December 2024) 780 NZPD (Fast-track Approvals Bill — In Committee—Part 1 (continued), Steve Abel and Chris Bishop).

[58] As above, relevant due to Fast-track Approvals Act 2024, s 43(2).

[59] Fast-track Approvals Act 2024, ss 53(2)(h) and (i). See also the information requirements in schedule 5 cl 5(1)(d.

[60] Fast-track Approvals Act 2024, s 53(2)(l).

[61] Fast-track Approvals Act 2024, s 53(2)(l).

[62] Fast-track Approvals Act 2024, s 53(2)(b) and (c).

4. The Trustees of the Tekapo Whitewater Trust and Whitewater New Zealand Incorporated;

5. Mackenzie District Council; and

6. New Zealand Transport Agency.

Furthermore, Genesis has received written letters of support from each of the above as well as from Transpower, Mount Cook Alpine Salmon and Te Rūnanga o Ngāi Tahu.

1.5.12 Assessment Criteria

Section 81 of the FTA sets out matters relevant to a decision on approvals sought in substantive application. Those matters are discussed in Table 8 below.

Table 8: Tekapo Reconsenting – Assessment Criteria for Fast Track Approvals Process

Clause	Assessment criteria		Comment
Options: grant or decline			
81(1)	The panel must, for each approval sought in a substantive application, decide whether to — (a) grant the approval and set any conditions to be imposed on the approval; or (b) decline the approval.		See comments on section 85 (When panel must or may decline approvals) in this table below.
Decision-making criteria			
81(2)(a)	For the purpose of making the decision, the panel must consider the substantive application and any advice, report, comment, or other information received by the panel under section 51, 52, 53, 55, 58, 67, 68,[63] 69, 70, 72, or 90 of the FTA.		
	Section 51	Panel convener obtains other advice and reports (1)(a) Any advice from the relevant administering agencies that the panel convener considers will be necessary for the panel to consider, and make decisions on, the approvals sought in the application;	Genesis has consulted with the Ministry for the Environment prior to lodging this application and no specific concerns were raised, as identified in section 1.5.3 above. It may not be necessary for any advice to be sought from the Ministry for the Panel to make its decision.
	Section 52	Panel convener provides information to panel (b) the report obtained under section 18 of the FTA in relation to the project;[64]	To the extent that it is relevant to the report prepared by the relevant agency under section 18 of the FTA, please refer to the report "Treaty Impact Assessment: the Tekapo and Waitaki Power Schemes", an assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd, July 2023 included as Appendix A to this application.
	Section 53	Panel invites comments on substantive application (2) Comments must be invited from—	
		(a) the relevant local authorities; and	As noted in section 1.5.3 of this assessment, Genesis has contacted the relevant local authorities (Canterbury Regional Council and Mackenzie District Council) to discuss the application. A letter of support has been received from Mackenzie District Council.
		(b) any relevant iwi authorities; and	As noted in section 1.5.3 of this assessment, Genesis has contacted the relevant iwi authorities (Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua) to discuss this application for approval. Letters of support for the RMA resource consent application for the continuation of the Tekapo PS have been received from Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua. Also refer to the report "Treaty Impact Assessment: the Tekapo and Waitaki Power Schemes", an assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd, July 2023 included as Appendix A to this application.
		(c) any relevant Treaty settlement entities, including, to avoid doubt,— (i) an entity that has an interest under a Treaty settlement within the area to which the substantive application relates; and (ii) an entity operating in a collective arrangement, provided for under a Treaty settlement, that relates to that area; and	Genesis has consulted with Te Rūnanga o Ngāi Tahu regarding the RMA resource consent application for the continuation of the Tekapo PS and received a letter of support for the application in conjunction with the letters of support from Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua. Te Rūnanga o Ngāi Tahu has confirmed that the Charter of Te Rūnanga o Ngāi Tahu constitutes Te Rūnanga as kaitiaki of the collective tribal interests.
		(d) any protected customary rights groups and customary marine title groups whose protected customary rights area or customary marine title is within the area to which the substantive application relates; and	Not applicable.
		(e) any applicant group under the Marine and Coastal Area (Takutai Moana) Act 2011 that is identified in the report prepared under section 18 or 49 of the FTA and seeks recognition of customary marine title or protected customary rights within the area to which the substantive application relates; and	Not applicable.

[63] Section 68 relates to concession, land exchange, or access arrangements and is irrelevant.

[64] Section 18 requires the Minister to obtain and consider a report on Treaty settlement and other obligations as part of a referral application. Section 49 requires that the EPA do the same in relation to listed projects with some modifications.

Clause	Assessment criteria		Comment
		(f) ngā hapū o Ngāti Porou if the area to which the substantive application relates is within or adjacent to, or the activities to which it relates would directly affect, ngā rohe moana o ngā hapū o Ngāti Porou; and	Not applicable.
		(g) the tangata whenua of any area within the area to which the substantive application relates that is a taiāpure-local fishery, a mātaitai reserve, or an area that is subject to bylaws or regulations made under Part 9 of the Fisheries Act 1996; and	Not applicable.
		(h) the owners of the land to which the substantive application relates and the land adjacent to that land; and	Genesis owns the land to which the substantive application relates and has operating easements in relation to other land adjacent to parts of the scheme. See also section 1.5.11 of this assessment.
		(i) the occupiers of the land to which the substantive application relates and the land adjacent to that land unless, after reasonable inquiry, an occupier cannot be identified; and	See section 1.5.11 of this assessment.
		(j) the Minister for the Environment and other relevant portfolio Ministers; and	The Minister for Energy and the Minister for Resources may be relevant portfolio Ministers.
		(k) relevant administering agencies; and	Genesis has consulted with the Ministry for the Environment prior to lodging this application as identified in section 1.5.3 above. Table 2 (Applicable National Policy Statements) and Table 3 (Applicable National Environmental Standards) were added to this document as a result of that consultation. There are no other relevant administering agencies
		(l) any requiring authority that has a designation on land to which the substantive application relates or on land adjacent to that land; and	The New Zealand Transport Agency has a designation for State Highway 18 which crosses the Tekapo Canal and is in part on land to which the substantive application relates. Genesis has an agreement with the Agency regarding scheme activities. Transpower has designations for the Takapō / Tekapo A Outdoor Switchyard and the Tekapo B Outdoor Switchyard which connect the Tekapo A and B stations to the National Grid.
		(m) if the approvals sought in the substantive application include— (i) an approval described in section 42(4)(a) or (d) (resource consent or designation), the persons and groups listed in clause 13 of Schedule 5: (. . .)	Genesis has contacted the Department of Conservation regarding the application and has reached an agreement with the Department regarding the RMA resource consent application for the continuation of the Tekapo PS. The Director General of Conservation provided a letter of support for the RMA resource consent application for the continuation of the Tekapo PS that noted: *The Agreement fully resolves my interests in Meridian's and Genesis' applications for replacement consents for the Waitaki Power Schemes. I want to acknowledge the success of Project River Recovery over the last three decades and look forward to seeing what we can achieve as the scope and scale of this work expands through this new agreement.* There are no Mana Whakahono ā Rohe or joint management agreements applicable to the Tekapo PS.
		Clause 13: For the purposes of section 53(2)(m)(i), the persons or groups are— (a) the Director-General of Conservation: (b) iwi authorities and groups that represent hapū that are parties to relevant Mana Whakahono ā Rohe or joint management agreements.	
		(3) Comments may be invited from any other person the panel considers appropriate	In section 1.5.11, Genesis has identified persons whom it considers the Panel should exercise its "appropriateness" discretion under the FTA to invite comments from.
	Section 55	Response to comments provided under section 53	Genesis intends to provide a response to comments received at the relevant time in the FTA process.
	Section 58	Other provisions about conduct of hearing	Based on the presently available information and the letters of support received for the application, Genesis presently considers that a hearing will not be required for this application.
	Section 67	Panel may request further information or report	Genesis will respond to any further information requests sought.
	Section 69	Panel provides draft decisions to applicant before declining approval	Genesis considers that the conditions proposed in Appendix D are appropriate for the resource consents sought.
	Section 70	Panel seeks comment on draft conditions before granting approval	Genesis considers that the conditions proposed in Appendix D are appropriate for the resource consents sought. Genesis intends to provide a response to draft conditions at the relevant time in the FTA process.
	Section 72	Panel seeks comments from Minister for Māori Crown Relations: Te Arawhiti and Minister for Māori Development	Genesis intends to provide a response should any comments be received.

Clause	Assessment criteria		Comment
	Section 90	EPA may request information from relevant administering agencies and local authorities	Comments from the Ministry for the Environment, CRC and MDC have been taken into account as appropriate in preparing this AEE and the proposed consent conditions in Appendix D.
81(2)(b) 81(3)	For the purpose of making the decision, the panel must apply the applicable clauses set out in **subsection (3):**		
	For the purposes of **subsection (2)(b)**, the clauses are as follows: (a) for an approval described in section 42(4)(a) (resource consent), **clauses 17 to 22 of Schedule 5**:[65] (…)		
	Clause 17 of Schedule 5[66]	(1) For the purposes of **section 81**, when considering a consent application and setting conditions, the panel must take into account, giving the greatest weight to **paragraph (a)**,—	
		(a) the purpose of this Act; and	The Tekapo PS has significant regional and national benefits. The granting of consents for the continuation of the Tekapo PS will enable those benefits to continue to be delivered.
		Section 3 The purpose of this Act is to facilitate the delivery of infrastructure and development projects with significant regional or national benefits	
		(b) the provisions of Parts 2,[67] 3, 6, and 8 to 10 of the Resource Management Act 1991 that direct decision making on an application for a resource consent (but excluding section 104D);[68] and	See section 7 of this assessment and in particular section 7.2 (section 104 assessment), section 7.2.12 (determination of controlled activities), section 7.3 (Part 2 matters), section 7.4 (section 105 matters), section 7.5 (section 107 matters) and section 7.6 (section 124B matters).
		(c) the relevant provisions of any other legislation that directs decision making under the Resource Management Act 1991.	Not applicable.
	Clause 18 of Schedule 5	When setting conditions on a consent, the provisions of Parts 6, 9, and 10 of the Resource Management Act 1991 relevant to setting conditions on a resource consent apply to the panel, subject to all necessary modifications[69]	See table below regarding consent conditions.
81(2)(c)	For the purpose of making the decision, the panel must comply with **section 82**, if applicable:		
	Section 82	(1) This section applies if a Treaty settlement, the Marine and Coastal Area (Takutai Moana) Act 2011, or the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019, a Mana Whakahono ā Rohe is relevant to an approval.	The Ngāi Tahu Claims Settlement Act 1998 is relevant to the approval. Ngāi Tahu have statutory acknowledgements with respect to Takapō, Lake Tekapo (Schedule 57), Lake Pūkaki (Schedule 34) and Waitaki River (Schedule 72).
		(2) If the settlement or Act, provides for the consideration of any document,70 the panel must give the document the same or equivalent effect through the panel's decision making as it would have under any relevant specified Act.	The statutory acknowledgments in the Ngāi Tahu Claims Settlement Act 1998 are relevant to consent authorities in respect of notification of a resource consent application, which is not applicable to the fast-track process. The scope of the statutory acknowledgments is shown in Figure 2 and the implications of the acknowledgements are discussed in Appendix A. Letters of support on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua are included in Appendix B.
		(3) The panel must also consider whether granting the approval would comply with section 7.	
		Section 7 (1) All persons performing and exercising functions, powers, and duties under this Act must act in a manner that is consistent with— (a) the obligations arising under existing Treaty settlements; ….	Please refer to the report "Treaty Impact Assessment: the Tekapo and Waitaki Power Schemes", an assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for Meridian Energy Ltd and Genesis Energy Ltd, July 2023 included as Appendix A to this application.
81(4)	When taking the purpose of this Act into account under a clause referred to in subsection (3), the panel must consider the extent of the project's regional or national benefits.		The Tekapo PS has significant regional and national benefits. The granting of consents for the continuation of the Tekapo PS will enable those benefits to continue to be delivered.

[65] Clause 19 of Schedule 5 is irrelevant to the project as it deals with freshwater fisheries matters. Clause 21 is also irrelevant as is relates to aquaculture decisions.

[66] Clauses 17(3) and (4) are irrelevant to the project as it is not a prohibited activity; and clause 17(5) is irrelevant as the project does not involve an application for a coastal permit for aquaculture activities.

[67] Clause 17(2)(a) provides that for the purpose of applying any provision in subclause (1) – (a) a reference in the Resource Management Act 1991 to Part 2 of that Act must be read as a reference to sections 5, 6, and 7 of that Act. Clause 12(2)(b) is irrelevant to the project as it is not the subject of a determination under s 22D.

[68] Clause 12(6) requires the provisions to be read will all necessary modifications, including that a reference to a consent authority must be read as a reference to a panel.

[69] Including that: (a) a reference to a consent authority must be read as a reference to a panel; and (b) a reference to services or works must be read as a reference to any activities that are the subject of the consent application.

[70] Clause 82(4) provides that 'document': (a) means any document, arrangement, or other matter; and (b) includes any statutory planning document amended as a result of the settlement or Act referred to in subsection (1).

Clause	Assessment criteria		Comment
Reasons to decline			
81(1)(b) 81(2)(f)	The panel must, for each approval sought in a substantive application, decide whether to decline the approval.		Genesis notes that the activities for which resource consents are sought are controlled activities under the CLWRP[71] and WAP.[72] Under sections 87A(2)(a) and 104A of the RMA (which the Panel must take into account under FTA Schedule 5 clause 17(1)(b)), the Panel must grant the resource consent unless it has insufficient information to determine whether or not the activity is a controlled activity.
	For the purpose of making the decision, the panel <u>may</u> decline the approval <u>only in accordance with</u> **section 85**.		
	Section 85	***Mandatory decline***	The project is not for an ineligible activity and is consistent with the obligations arising under existing Treaty settlements. Granting the consents sought would not breach section 7.
		(1) The panel must decline an approval if— 73 (a) the approval is for an ineligible activity; (b) the panel considers that granting the approval would breach section 7; …	
		Discretion to decline	
		(3) A panel may decline an approval if, in complying with section 81(2), the panel forms the view that— (a) there are 1 or more adverse impacts in relation to the approval sought; and (b) those adverse impacts are sufficiently significant to be out of proportion to the project's regional or national benefits that the panel has considered under section 81(4),even after taking into account – (i) any conditions that the panel may set in relation to those adverse impacts; and (ii) any conditions or modifications that the applicant may agree to or propose to avoid, remedy, mitigate, offset, or compensate for those adverse impacts.	The effects of the activities for which resource consents are sought have been fully assessed as reported in this assessment. Potential adverse of the reconsenting of the Tekapo PS will be avoided, remedied or mitigated through the proposed conditions and agreements reached and will not be out of proportion to the significant regional and national benefits that the Tekapo PS has.
Ability to impose conditions if consent is granted			
81(2)(d)	For the purpose of making the decision, the panel <u>must</u> comply with **section 83** in setting conditions:		
	Section 83	When exercising a discretion to set a condition under this Act, the panel <u>must not set a condition that is more onerous than necessary</u> to address the reason for which it is set.	The conditions proposed with this application are appropriate and reasonable to address the effects of the Tekapo PS.
81(2)(e)	For the purpose of making the decision, the panel <u>may</u> impose conditions under **section 84**:		
	Section 84	(1) For the purposes of section 7, the panel may set conditions to recognise or protect a relevant Treaty settlement and any obligations arising under the Marine and Coastal Area (Takutai Moana) Act 2011 or the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019. (2) This section applies in addition to, and does not limit, any other powers to set conditions under this Act.	Genesis has reached agreement with Te Rūnanga o Arowhenua, Te Rūnanga o Moeraki, Te Rūnanga o Waihao regarding the ongoing operation of the Tekapo PS and considers that no additional consent conditions are required in this regard.
Clauses 17 and 18 and Schedule 5 (as above)	**Clause 17**	(1) For the purposes of section 81, when considering a consent application and setting conditions, the panel must take into account, giving the greatest weight to paragraph (a),— … (b) the provisions of Parts … 6 …of the Resource Management Act 1991 that direct decision making on an application for a resource consent (but excluding section 104D); …	See section 7 of this assessment and in particular section 7.2 (section 104 assessment), section 7.2.12 (determination of controlled activities), section 7.3 (Part 2 matters), section 7.4 (section 105 matters), section 7.5 (section 107 matters) and section 7.6 (section 124B matters).
	Clause 18	When setting conditions on a consent, the provisions of Parts 6, 9 and 10 of the Resource Management Act 1991 relevant to setting conditions on a resource consent apply to the panel, subject to all necessary modifications[74]	The conditions proposed by Genesis take into account the matters in Part 6 (Resource Consents) and in particular the requirements of RMA section 108 (Conditions of resource consents) and section 108AA (Requirements for conditions of resource consents). There are no Water Conservation Orders (RMA Part 9) or Subdivisions and reclamations (Part 10) relevant to the Tekapo PS consents.

[71] Canterbury Land and Water Regional Plan.

[72] Waitaki Catchment Water Allocation Regional Plan.

[73] Clause 85(1)(d) and (f) are irrelevant to the project as it is not seeking a certificate of compliance or a land exchange.

[74] Including that: (a) a reference to a consent authority must be read as a reference to a panel; and (b) a reference to services or works must be read as a reference to any activities that are the subject of the consent application.

1.5.13 The Existing Environment

In preparing these applications, consideration has been given to the existing environment within which the Tekapo PS operates. Construction of the Waitaki Power Scheme commenced almost 100 years ago in 1928, while Tekapo A power station was commissioned in in 1951 and Tekapo B in 1977. The scheme has thus been part of the existing environment for many years.

When determining whether to grant resource consent, regard must be given to any actual and potential effects on the environment of allowing the activity. To determine the scale of the actual and potential effects, an environmental baseline – the "existing environment" – needs to be ascertained. The "existing environment" is not a term used in the legislation but is a shorthand reference to the baseline starting point against which to assess effects.

A more detailed discussion of the case law on ascertaining the existing environment, and the context and application of the existing environment, and CRC acceptance of that approach, is set out in **Appendix F.** The High Court has implicitly acknowledged that the environmental baseline may include structures authorised by the consents being renewed (and the effects that flow from those structures) if it would be "fanciful or unrealistic" to assess the existing environment as if the structures did not exist. Genesis has relied on that interpretation of the environmental baseline in the preparation of this application.

It is also noted that Policy 4.51 in the Canterbury Land and Water Regional Plan ("**CLWRP**") acknowledges that "*in recognition of their national benefits, existing hydro-electricity generation, and irrigation schemes and principal water supplier schemes and their associated water takes, use, damming, diverting and discharge of water are to be considered as part of the existing environment*".

The construction and commissioning of the Tekapo PS (for Tekapo A in 1951, with work commencing in 1938, and for Tekapo B in 1977) fundamentally, and to all intents permanently, altered the pre scheme environment (and the combined WPS, the environment of the whole of the catchment). Adverse effects that occurred at that time are difficult (and often impossible) to quantify and the situation is complicated by more recent factors such as didymo and land use changes. It would be fanciful and unrealistic to assess the existing environment without the Tekapo PS (and the combined WPS) in place and operational. As the consents seek to maintain 'status quo' flow regimes the existing environment will continue. However, mitigation through conditions, can be required when appropriate for more than minor adverse effects on values of significance from the ongoing operation of the Tekapo PS over the term of the consents being sought.

The existing environment has been modified since the commissioning of the Tekapo PS by changes and improvements including the upgrade to the Intake Structure and relining of the Tekapo Canal. In addition, and as set out in section 3 of this AEE and noted above, a number of activities associated with the Tekapo PS are permitted activities and form part of the existing environment as a consequence. Defining the existing environment for the purposes of assessing the effects of the resource consent applications does not require a decision maker to assume that the effects of the Tekapo PS never existed (that is, to postulate a return to a pristine and naturalised environment); this would be a fanciful and unrealistic exercise which does not reflect a 'real-world' approach. Having said that, the technical assessments have not discounted effects caused by the ongoing activities for which the replacement consents are required.

The technical reports and planning assessments have therefore adopted an approach that, in summary:

a. Takes the environment to be assessed as that at the time of the assessment;

b. Identifies and determines the significance of existing values;

c. Identifies whether any values of significance are affected, to a more than minor degree, by the ongoing operation of the Tekapo PS (for example the Tekapo PS may be causing a continued more than minor downward trajectory of a value of significance, equally it may be causing a positive trend); and

d. If any such matters are identified then mitigation, offsetting, and compensation (as appropriate) for those more than minor adverse effects is considered.

In respect of the Tekapo PS it is noted that:

1. As set out in this AEE, Genesis is not applying for resource consents to manage the dams or to open and close gates. All structures associated with the Tekapo PS are permitted activities in accordance with the applicable rules in the CLWRP. Genesis is seeking replacement consents for the section 14 and section 15 RMA matters (the taking, use, damming, diverting and discharging of water required for the operation of the Tekapo PS) as required by rules in the Waitaki Catchment Water Allocation Plan ("**WAP**") and the CLWRP; and

2. The dam structures and other structures associated with the Tekapo PS are permitted land uses and would remain even if the electricity generation activities were to cease. While those structures are in place, resource consents would still be required to dam and divert water.

1.5.14 Offsite Compensation

As part of the 1990 water rights process, the Department of Electricity and the Electricity Corporation of NZ ("**ECNZ**") signed an agreement with DoC and other parties to provide

funding for a programme that will "*provide … conservation benefits in terms of habitat availability*".[75]

This became known as Project River Recovery ("**PRR**"), which commenced in 1991 with the aim of mitigating some of the effects of hydroelectric power generation by protecting or restoring braided river and wetland ecosystems in the upper Waitaki Basin (in catchments above the Tekapo PS) by developing new habitat or to redeveloping degraded habitat, to increase the amount of good habitat in the basin, commensurate with or greater than what existed prior to hydro-electric development in the upper Waitaki.

PRR is the largest and longest running programme of its kind in New Zealand and runs an extensive weed eradication program over 35,000 hectares of near pristine river habitat and conducts research into braided river ecosystems. A 100 acre wetland has been constructed, and education programs are run for school and university students. Predator control has also been an important component of the project. Hedgehogs, stoats, ferrets and feral cats have been found to have a devastating impact on ground-nesting wading birds and a trapping programme is in place to remove these introduced predators, which also targets possums and weasels.

Birdlife in the area has benefited significantly from these programs, with banded dotterels, black front terns, and wrybills successfully hatching and rearing a greater number of young. A review the effectiveness, efficiency and ecological significance of PRR operations completed in 2012[76] found that Project River Recovery has been a highly effective braided river restoration agency since its inception.

Examples of the significant achievements of PRR can be seen in the 2022 PRR Annual Report which identifies measures implemented during the 2021-2022 year, including:

1. Over 620 hectares of targeted, ground-based, and aerial spot spraying of weeds in nine main sites: Ōhau, Ahuriri, and Pūkaki Rivers, Ruataniwha wetland, Waterwheel Wetland, Lake Poaka, Lake Ōhau, Ōhau Canal, and Twaddle's Stream, and two other small sites; Tern Island and some lizard habitat in gullies beside Lake Benmore.

2. Traditional PRR control sites such as the Tasman, Cass and Godley Rivers and Fork Stream were sprayed, and additionally, $34,000 was contributed to ongoing joint programmes in the Tekapo and Dobson Rivers.

---

[75] As set out in the evidence of P.D. Palmer for the Minister of Conservation for the hearing by a Standing Tribunal of Canterbury Regional Council.

[76] In Rebergen, A.L.; Woolmore, C.B. 2015: Project River Recovery Strategic Plan 2012– 2019. Project River Recovery Report 2015/01, Department of Conservation, Twizel.

3. The eighteenth year of trapping results from the Tasman River Predator Control Project, a joint programme between the South Canterbury Core TB Management Area, PRR and the kaki management programme with 535 hedgehogs, 148 rabbits, 388 stoats, 65 cats, 33 ferrets, 37 weasels, 10 rats, 23 possums and 12 mice being caught.

4. Continuation of the programme of intensive predator trapping around the black-fronted tern colony in the upper Ōhau River for the thirteenth year with a total of 71 hedgehogs, 175 rabbits, 91 ferrets, 43 cats, 17 rats, 26 possums, 11 stoats, and two weasels being caught. 522 black-fronted terns/tarapirohe returned to the island for breeding this year with 772 eggs being monitored. By the end of the season, at least 20 fledglings had been sighted on the island with an estimated range of 8-310 chicks having fledged during the season.

5. Completion of walk-through riverbed bird counts on the Hopkins, Dobson, and Hakataramea Rivers.

6. Continuation of support for a nation-wide bittern/matuku hūrepo study by deploying 22 Acoustic Recording Devices in locations across the basin in 2021-22, six of which returned positive detections of bitterns.

7. Ongoing Galaxiid monitoring and/or trout/kōaro removal was carried out above nine constructed and two natural trout barriers at Fraser stream, Corbies Creek, Fork Stream, Hunter Hills, Waterwheel Wetland, Otamatapaio River and Omarama Station.

8. Annual monitoring of robust grasshoppers across six key populations along with a survey of the entire length of the Tekapo River, and the Ōhau River below Lake Ruataniwha.

9. Monitoring of five populations of *Lepidium solandri* across the basin continued to better understand population trends.

10. Wetland management, including weed control and water-level manipulation at Waterwheel and Ruataniwha wetlands, designed to benefit threatened ephemeral plants that occur in these habitats.

11. Since the commencement of works associated with PRR, in the Tasman catchment banded dotterel, black billed gull and black-fronted tern had significantly higher numbers recorded in 2022, when compared with the first survey in 1992.

A number of the technical assessments appended to this AEE have provided an independent assessment of PRR; all of which conclude that it has had tangible environmental benefits, for example:

a. Analysis of the difference in abundance of birds recorded show significant increases for a number of species where PRR management is occurring, providing benefits for banded dotterel, black-billed gull, black-fronted tern and NZ pied oystercatcher (BlueGreen Avifauna, 2025);[77]

b. The conservation benefits of the work undertaken by PRR for controlling lizard predators greatly exceeds the very low level of adverse effects that may be caused by the Tekapo PS scheme on native lizards (RMA Ecology Ltd, 2023);[78]

c. Conservation programmes partially funded by PRR are creating predator free streams by removing salmonids and placing fish passage barriers in the streams to prevent reinvasion (Water Ways Consulting, 2025);[79]

d. The ongoing effects of the Tekapo PS on terrestrial invertebrates are minor at worst and are more than offset by PRR which represents a very good mitigation and off-set strategy (Entecol Limited, 2025);[80] and

e. Project River Recovery has made a substantial contribution to maintaining indigenous vegetation in the Waitaki catchment, particularly with respect to weed control (Ecological Solutions, 2023).[81]

As a core part of the replacement resource consents being sought, to mitigate and compensate ongoing adverse effects of the Tekapo PS on the environment, Genesis is proposing to continue and increase its funding to DoC for an indigenous biodiversity enhancement programme as a key vehicle for improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment.

1.6 RESOURCE CONSENTS REQUIRED

Genesis currently holds 31 active CRC resource consents authorising the operation of the Tekapo PS, 21 of which expire in April 2025. Replacement consents (where the activity is not permitted under the relevant regional plans) are required to allow continued operation of the Tekapo PS past the expiry of these consents. A number of resource

---

[77] Tekapo Re-Consenting: Assessment of Ecological Effects – Avifauna, 2025. Prepared by BlueGreen Ecology Limited.

[78] Tekapo Power Scheme re-consenting, Tekapo Herpetofauna Effects Assessment, Job 2004, 2023. Prepared by G Ussher (RMA Ecology Ltd).

[79] Tekapo Power Scheme: Native Fish Assessment of Ecological Effects, Report 61-2018, 2025. Prepared by Water Ways Consulting Ltd.

[80] A Review of Terrestrial Invertebrate Information for the Tekapo Power Scheme Resource Consents, Entecol Report: ENT-063, 2025. Prepared by CP Ong & RJ Toft (Entecol Limited).

[81] Tekapo Power Scheme Reconsenting Assessment of Effects – Vegetation, 2023. Prepared by Ecological Solutions Limited.

consents expire well after April 2025[82] and therefore these consents are not proposed to be replaced as part of this process.

Resource consents CRC905310.2,[83] CRC905311.2,[84] CRC905313.2,[85] CRC905314.2,[86] CRC905315.2,[87] CRC905316.2,[88] CRC905317.2,[89] CRC905318.2,[90] and CRC083496.1[91] which also expire in 2025 are not being replaced as part of this process as the diversion works have been completed and the activities are now provided for by permitted activity rules in the WAP and CLWRP or the culverts now form part of the bed of the waterway and are effectively a modified bed, rather than a diversion of water with no consent for diversion being necessary.[92]

Genesis is therefore applying for consolidated resource consents under the FTA to authorise the following activities:

1. **Water Permit** – To dam, take, divert and use water associated with the operation of the Tekapo PS; and

2. **Discharge Permit** – To discharge water and associated contaminants associated with the operation of the Tekapo PS.

The resource consents that are being replaced as part of this replacement resource consent process are summarised in Table 9.

This report provides an AEE of the activities that require resource consent under the WAP and CLWRP to replace the existing resource consents that expire in April 2025.

---

82 CRC950297.2, CRC950298.2, CRC111767, CRC111740, CRC951545.2, CRC111762 and CRC111768.

83 To divert the natural flow of Fork Stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I37:051-825.

84 To divert the natural flow of Irishman's Creek through a culvert under the Tekapo-Pūkaki Canal at or about map reference I37:975-782.

85 To divert the natural flow of an unnamed stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I38:023-789.

86 To divert the natural flow of an unnamed stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I38:989-786.

87 To divert the natural flow of an unnamed stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I38:959-777.

88 To divert the natural flow of an unnamed stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I38:949-773.

89 To divert the natural flow of an unnamed stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I38:911-774.

90 To divert the natural flow of an unnamed stream through a culvert under the Tekapo-Pūkaki Canal at or about map reference I38:903-771.

91 To divert water from Tekapo Canal embankment to an unnamed tributary of Irishman's Creek.

92 Email confirmation from Z Smith (CRC) to J Page (Meridian), A Barnett (Genesis) and N Reuther (CRC) dated 2 May 2022, subject: Flood flows and Diversions – Ecan current position.

Table 9: Tekapo PS Replacement Consents Sought

Resource Consent Sought	Purpose / Location	Resource Consent Being Replaced
Water Permit – To Dam, Take, Divert and Use Water	To Dam the Takapō River at the Tekapo Control Structure (Gate 16) to Control and Operate Takapō Levels. To Dam the Takapō River at the Lake George Scott Control Weir to Control and Maintain Lake George Scott Levels. To Take, Divert and Use Water from the Takapō River via the Tekapo Canal Control Structure (Gate 17). To Take, Divert and Use Water from Takapō via the Tekapo Intake for the generation of electricity, and ancillary purposes, at the Tekapo A and B Power Stations.	CRC183551 – To dam Takapō River to control and operate Takapō between the levels of 701.80 and 710.90 metres (masl[93]) at or about map reference NZMS 260 I37:080-860 (Late Tekapo Control Structure). CRC905302.3 – To take up to 130 cubic metres of water per second from Takapō, at or about map reference NZMS 260 I37:080-866 for the purpose of power generation (Tekapo A Power Station). CRC905305.2 – To use water up to a maximum rate of 130 cubic metres per second for power generation at or about map reference I37:064-850 (Tekapo A Power Station) CRC905319.2 – To use water up to a maximum rate of 130 cubic metres per second at or about map reference H38:869-724 (Tekapo B Power Station). CRC905306.3 – To dam Takapō River to a level of 684.05 metres (masl) at or about map reference NZMS 260 I37:065-849 (Lake George Scott Control Weir). CRC905307.2 – To divert water up to a maximum rate of 130 cubic metres per second from Takapō River at or about map reference I37:065-849 into Tekapo-Pūkaki Canal through Gate 17. CRC905308.2 – To take water up to a maximum rate of 130 cubic metres per second from Takapō River, at or about map reference I37:065-849 into the Tekapo-Pūkaki Canal.

[93] In this AEE, "**masl**" means metres above mean sea level, Lyttelton datum.

Resource Consent Sought	Purpose / Location	Resource Consent Being Replaced
Discharge Permit – To Discharge Water and Associated Contaminants	To Discharge Water and all associated Contaminants into Lake Pūkaki via the Tekapo B Tailrace. To Discharge Water and all Associated Contaminants into the Takapō River from the Tekapo Control Structure for the purpose of spilling water, to Bypass Tekapo A, for Lake George Scott Water Level Maintenance and for Recreational Release Purposes. To Discharge water and all associated contaminants into the Takapō River from the Lake George Scott Control Weir for the Purpose of Spilling Water.	CRC905320.2 – To discharge water up to a maximum rate of 130 cubic metres per second into Lake Pūkaki at or about map reference H38:869-724 via Tekapo B Power Station Tailrace. CRC905304.3 – To discharge water up to a maximum rate of 850 cubic metres per second into Takapō River via Tekapo Control Structure at or about map reference I37:080-860. CRC905309.4 – To discharge water up to a maximum rate of 600 cubic metres per second into Tekapo-River, at or about map reference I37:065-850 via Lake George Scott Control Weir to control lake storage levels.

1.7 REPORT STRUCTURE

The structure of this AEE is as follows:

Section 1: Provides background to the Tekapo PS, an introduction to Genesis, details the approach to developing these resource consent applications, discusses the relevant FTA matters applicable to this application and sets out the structure of this AEE.

Section 2: Provides a detailed description of the Tekapo PS.

Section 3: Provides an analysis of the rules contained in the WAP, CLWRP and the Mackenzie District Plan to identify the activity status for the applications under the present RMA planning documents.

Section 4: Describes the environmental setting, including general site characteristics and physical setting.

Section 5: Provides an assessment of environmental effects associated with the ongoing operation of the Tekapo PS.

Section 6 Details the operational parameters sought by Genesis, management procedures and plans, mitigation measures, and the nature of monitoring proposed as part of ongoing operation of the Tekapo PS.

Section 7: Sets out the RMA framework for the resource consent applications and considers the proposal in relation to the provisions of the relevant RMA planning documents. It also addresses relevant iwi management documents and other relevant matters such as climate change reports.

Section 8: Discusses the consultation and engagement undertaken in respect of the proposal.

Section 9: Is a concluding statement for the applications.

1.8 SUPPORTING TECHNICAL ASSESSMENTS

The various technical assessments that provide the detailed background information and the environmental assessments are appended to this AEE and are referenced throughout this AEE. This AEE should be read in conjunction with the supporting technical assessments.

Genesis has commissioned the following technical reports (Table 10):

Table 10: Technical Reports Supporting this AEE

Subject Matter	Report Title	Author	Appendix
Electricity Sector Benefits	*Tekapo Power Scheme – Electricity Sector Benefits*	Concept Consulting Limited	G
Natural Character, Landscape and Visual Amenity	*Tekapo Power Scheme Reconsenting: Natural Character, Landscape and Visual Amenity Effects Assessment*	Boffa Miskell Ltd	J
Groundwater and Hydrology	*Tekapo Power Scheme –Hydrological and Hydrogeological Analyses*	Pattle Delamore Partners	K
Aquatic Environment	*Tekapo Power Scheme Reconsenting: Assessment of Aquatic Environmental Effects*	Cawthron Institute	L
Native Fish	*Tekapo Power Scheme: Native Fish Assessment of Ecological Effects*	Water Ways Consulting Ltd	M
Shoreline Morphology	*Tekapo Power Scheme re-consenting: Lakeshore geomorphology and processes: Existing environment and future effects*	Shore Processes and Management Ltd	N
Terrestrial invertebrates	*A Review of Terrestrial Invertebrate Information for the Tekapo Power Scheme Resource Consents*	Entecol Ltd	O
Herpetofauna	*Tekapo Power Scheme reconsenting, Tekapo: herpetofauna effects assessment*	RMA Ecology Ltd	P
Avifauna	*Tekapo Power Scheme Reconsenting: Assessment of Ecological Effects – Avifauna*	BlueGreen Ecology Limited	Q
Vegetation	*Tekapo Power Scheme Reconsenting: Assessment of Effects – Vegetation*	Ecological Solutions Ltd	R
Recreation / Tourism	*Genesis Energy: Tekapo Hydro Scheme Reconsenting: Recreation Review*	Rob Greenaway & Associates	S

2. TEKAPO POWER SCHEME OVERVIEW

2.1 INTRODUCTION

As detailed in section 1 of this AEE, Genesis is seeking resource consents under the FTA to replace resource consents for the damming of the Takapō River, the taking and diversion of water from Takapō and the Takapō River, and the discharge of water and associated contaminants into Lake Pūkaki and the Takapō River from Tekapo PS operations that expire in 2025. The replacement consents will enable the continued operation of the Tekapo PS. Genesis is not proposing any material changes to the hydrological regime associated with the Tekapo PS.

The key activities that are encompassed by the two resource consents being sought to enable the continued operation of the Tekapo PS, are summarised as follows:

a. The damming of the Takapō River via the Tekapo Control Structure (Gate 16) to control and operate Takapō;

b. The taking, diversion and use of water from Takapō via the Tekapo Intake for the generation of electricity, and ancillary purposes, at the Tekapo A and B Power Stations;

c. The damming of the Takapō River at the Lake George Scott Control Weir to control and maintain water levels in Lake George Scott;

d. The taking, diversion and use of water from the Takapō River via the Tekapo Canal Control Structure (Gate 17);

e. The discharge of water and all associated contaminants into Lake Pūkaki;

f. The discharge of water and all associated contaminants into the Takapō River from Gate 16 for the purposes of spilling water, to bypass Tekapo A, for Lake George Scott water level maintenance and for recreational release purposes; and

g. The discharge of water and all associated contaminants into the Takapō River from the Lake George Scott Control Weir for the purpose of spilling water.

Figure 1 provides an overview of the Tekapo PS, and further details on each of the key Tekapo PS components, and the operating conditions, are provided in the following sub-sections.

2.2 HISTORY OF THE TEKAPO POWER SCHEME

In the 1920s investigations began to identify the potential for the Ōhau, Pūkaki and Takapō lakes to be used for hydro-electricity power development. The location of the Waitaki river between large centres of population in the 1920s made it an ideal river for such a development. Construction of the first dam on the Waitaki River, the Waitaki Dam,

commenced in 1928. The dam and power station with two generators, was commissioned in 1934-1935, followed by the Pūkaki Dam and Tekapo A power station in 1951.

Benmore was commissioned in 1965 and Aviemore in 1968, with the Tekapo B power station commissioned in 1977 and the Pūkaki High Dam completed in 1978. The Ōhau A (1980), Ōhau B (1984) and Ōhau C (1985) power stations completed the development of the WPS.

The WPS makes efficient use of water for electricity generation in that water used for generation at the Tekapo A and B stations subsequently passes through the Ōhau A, Ōhau B and Ōhau C power stations, generating further electricity that would not otherwise be possible without the Tekapo PS.

The construction of the power stations and associated infrastructure on the Waitaki River were initially authorised by Orders in Council dated 24 April 1929 and 27 September 1939. The original 1929 order authorised the Minister of Public Works to:

> Erect, construct, provide, and use such works, appliances and conveniences, as may be necessary in connection with the utilisation of water power from the Waitaki River, and in connection therewith to raise or lower the level of Lakes Tekapo, Pukaki and Ohau, and to control the flow of water from same for the generation and storage of electrical energy, and with the transmission, use, supply, and sale of electrical energy when so generated.

The 1939 Order in Council expanded the Minister of Works' authority to "*impound or divert…"* as well as control the flow or water from the same source.

The right to utilise the waters of the upper Waitaki River System were embodied in an Order of Council dated 18 August 1969. By this order in Council the Governor-General granted to the Ministry of Electricity the right to dam, use, divert, discharge and take the waters of the Fork Stream, Lakes Takapō, Pūkaki and Ōhau, and the Takapō, Pūkaki and Ōhau rivers. These waterbodies had previously been declared "Waters of National Importance" by an earlier Order in Council. The rights conferred by the August 1969 Order in Council had a term of 21 years with a lapse date of 18 August 1990.

The current resource consents were approved under the Water and Soil Conservation Act 1967 in 1990 to replace the Order in Council authorisations and are 'deemed resource consents' under the RMA.

The WPS is now divided into two parts: the first part includes the Tekapo A and Tekapo B hydro-generation assets and associated canal network which are owned and operated by Genesis which is referred to as the Tekapo PS; the balance of the WPS is owned and operated by Meridian Energy Limited. The Tekapo PS, while having been owned operated separately from the rest of the WPS since 2011, forms part of the combined WPS.

Genesis purchased the Tekapo PS on 1 June 2011 for $821 million from Meridian Energy. The Tekapo PS now plays an important role in Genesis' generation portfolio. The scheme provides balance to Genesis' diverse generation assets which were, prior to the purchase of the Tekapo PS, predominately thermal as well as exclusively North Island. Ownership of the Tekapo PS enables Genesis to make more competitive offers to South Island customers.

The following figures show the development of the components which now make up the Tekapo PS.

Figure 3: Tekapo A Power Station Construction (1949)

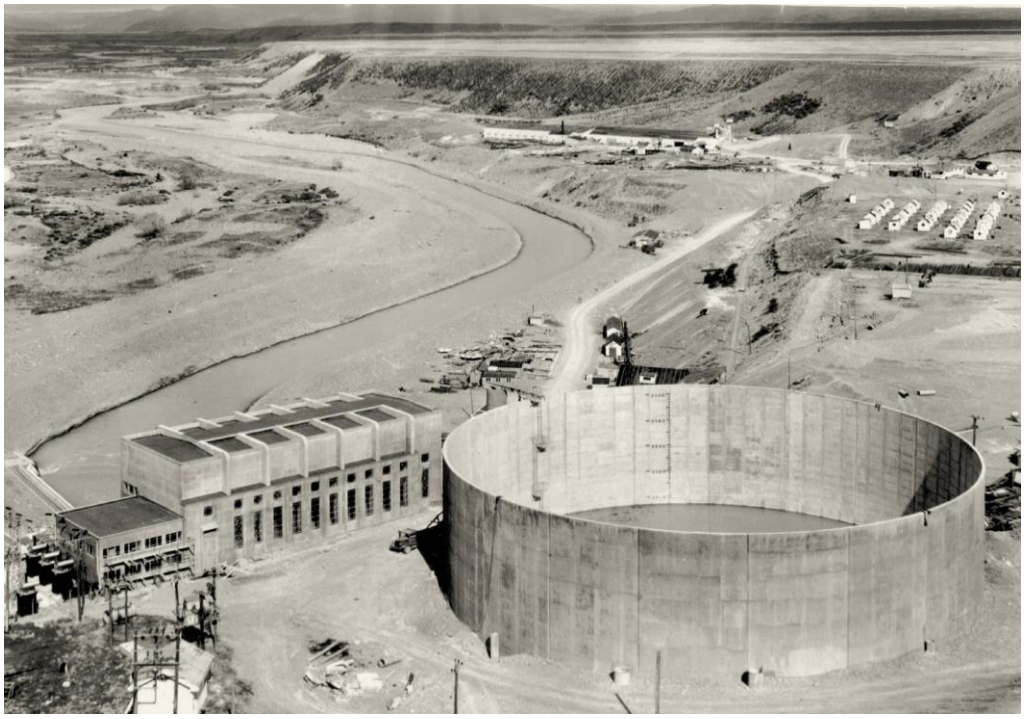

Figure 4: Tekapo A Power Station and Surge Chamber Construction (1951)

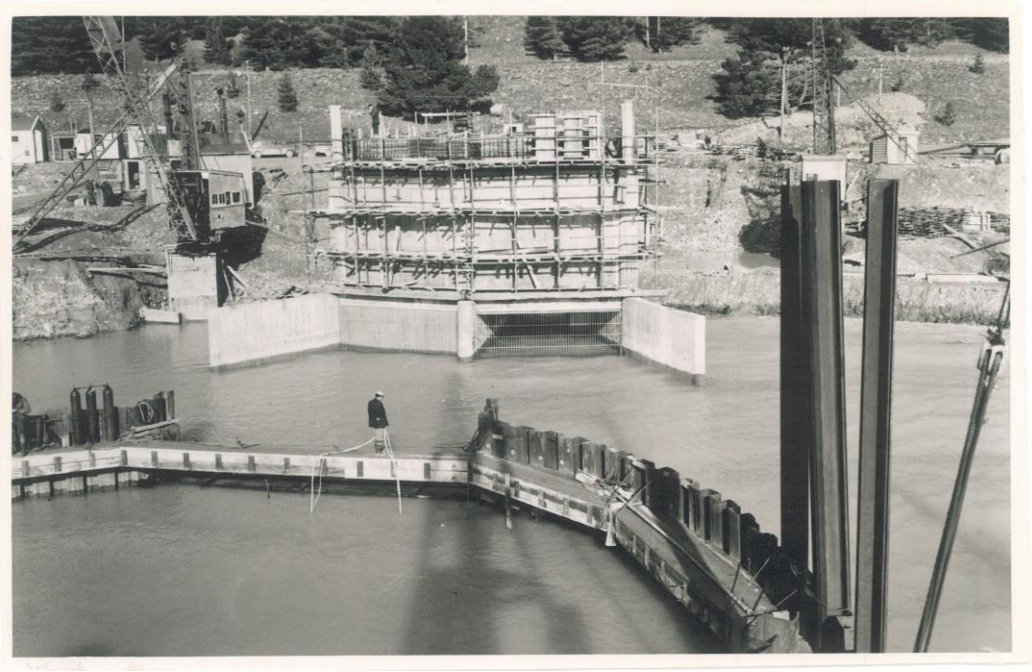

Figure 5: Tekapo Intake During Construction (1951)

Figure 6: Tekapo Intake Nearing Completion (1952)

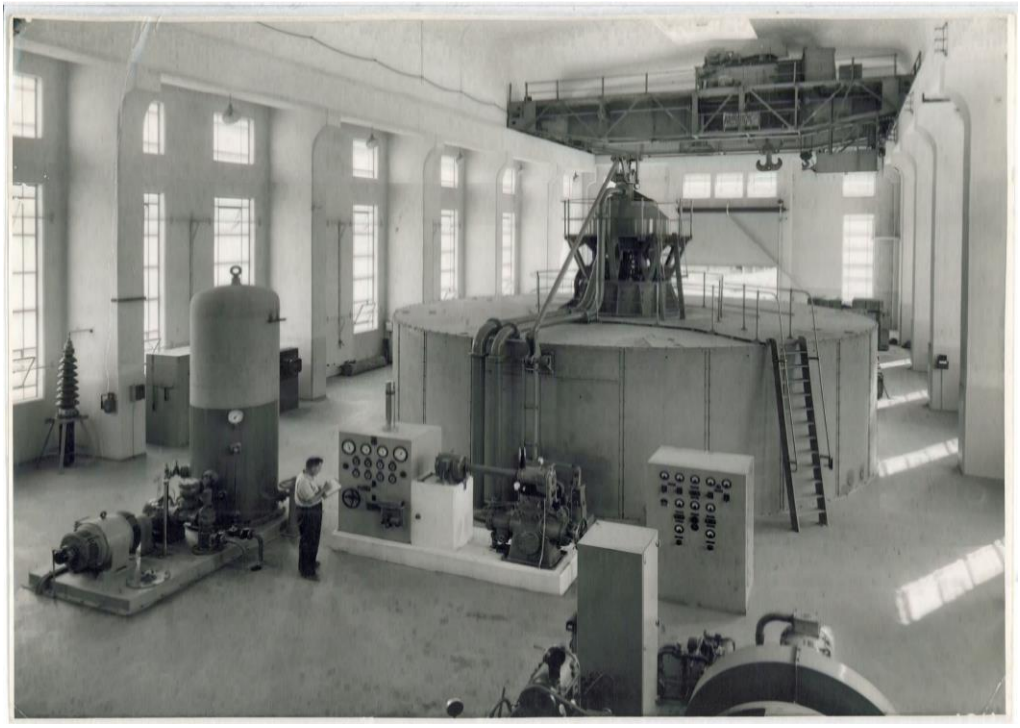

Figure 7: Tekapo A Power Station Turbine Hall (1952)

Figure 8: Tekapo Dam and Temporary Housing for Workers (May 1955)

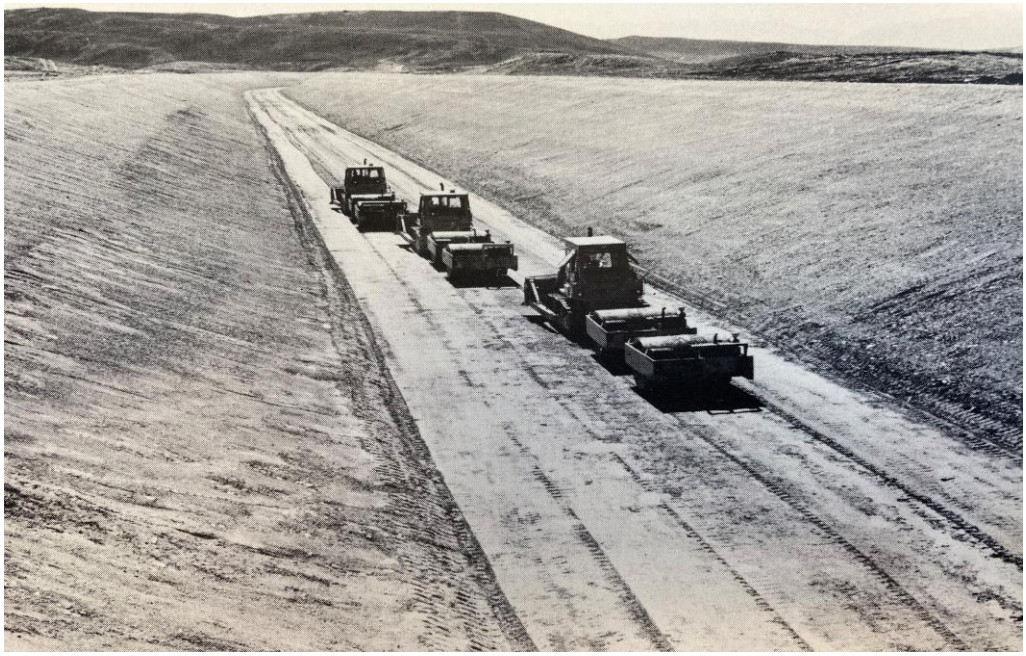

Figure 9: Tekapo Canal Construction (1970)

Figure 10: Tekapo Canal Construction (1971)

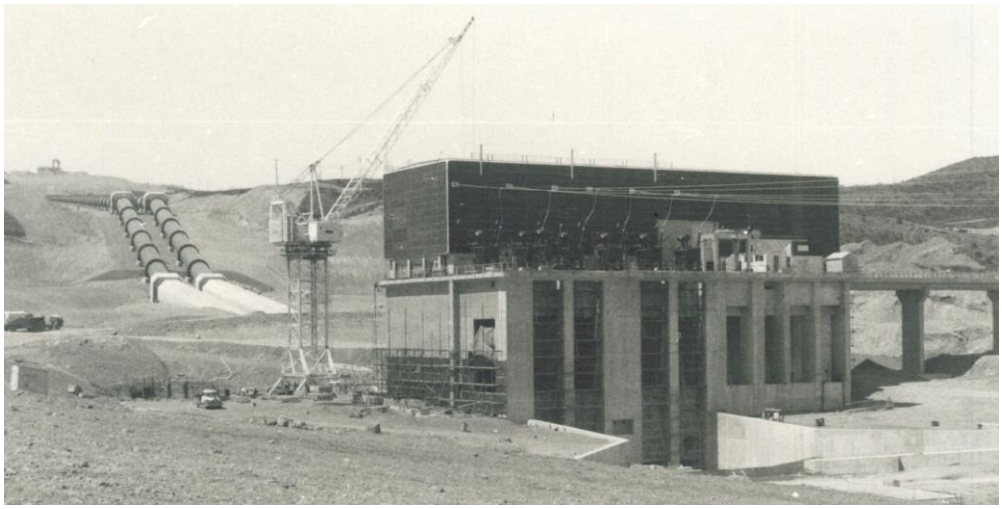

Figure 11: Tekapo B Power Station Construction (1970)

Figure 12: Tekapo B Power Station Construction (1977)

As these images show, the development of the Waitaki Catchment for hydro-electricity generation purposes substantially altered lake edge, delta, braided river and wetland habitat. Some of the habitat loss was by way of flooding or river flow alterations, others by emergent exotic vegetation growth in riverbeds in part due to reduced flood flows. Fisheries were also altered due to the changes in flow regimes.

There have, however, been positive ecological effects of the development of the Tekapo PS. For example, the removal of large sediment laden flows from the Takapō River potentially has created better fisheries and bird habitat.

2.3 TAKAPŌ

Takapō is the sole source of water for the Tekapo PS. The lake is dammed by Gate 16 (see Figure 13, looking downstream from Takapō) at the head of the Takapō River.

Gate 16 also forms the crossing point for State Highway 8 ("**SH8**") over the Takapō River.

Figure 13: Gate 16, viewed from Takapō

Takapō has minimum and maximum operating levels that vary throughout the year. The minimum operating level of Takapō is as follows:[94]

a. 1 April and 30 September – Minimum Level of 701.8 masl; and

b. 1 October and 31 March – Minimum Level of 704.1 masl.

The level of Takapō may be further reduced to 701.8 masl between 1 October and 31 March if the Electricity Authority[95] determines that reserve generation capacity is required, or when the aggregate storage for the nation or for the region that includes the Waitaki catchment is below the Contingent Storage Alert Release Boundary established by the New Zealand electricity network System Operator. Policy 37 in the WAP also provides for the temporary lowering of Takapō where necessary for the purposes of maintenance or rehabilitation of electricity generation infrastructure.

The maximum operating levels for Takapō are as follows:

a. September to February – Maximum Level of 709.7 masl;

---

[94] Rule 3, Table 4 in the WAP.

[95] Formerly the Electricity Commission, which was superseded in 2010.

b. March – Maximum Level of 710.0 masl;

c. April and August – Maximum Level of 710.3 masl;

d. May – Maximum Level of 710.6 masl; and

e. June and July – Maximum Level of 710.9 masl.

Lake levels can vary outside the maximum control levels specified in the resource consents when inflows to Takapō exceed the maximum possible outflows from the lake. In that regard, Genesis is presently required to control and operate the level of Takapō in accordance with the provisions contained in "*Tekapo Power Scheme, Appendix A, Extracts of Waitaki operating Rules (9 November 1990), as modified by an order pursuant to Section 122 of the Electricity Industry Act 2010*" (also known as "**the Flood Rules**"). A minor change to the flood rules is being considered for the ongoing operation of the Tekapo PS.

The storage volume available in the lake between the maximum and minimum levels specified is important for maintaining electricity supply security in New Zealand.

Genesis has operated and controlled the level of Takapō in accordance with the provisions described above since it took ownership of the Tekapo PS.

2.4 TAKAPŌ RIVER AND LAKE GEORGE SCOTT

The Takapō River is the natural outlet of Takapō, although it is dammed and controlled for hydro-electricity purposes at Gate 16. Gate 16 consists of five steel radial gates (shown in Figure 14, with one gate releasing water) that were constructed across the outlet of the lake in 1954, around three years after Tekapo A Power Station commenced operation. The gates have a total consented discharge capacity of 850 cubic metres per second ("**m^3/s**").

The Takapō River is further dammed approximately three kilometres downstream of Gate 16 by a concrete weir, creating Lake George Scott. Figure 15 shows the Tekapo A Power Station (left of image), Lake George Scott (centre right of image), the Lake George Scott Weir (right of image), the Tekapo Canal (lower right of image) and Gate 17 (centre of image).

Water discharged from Takapō via Gate 16 is impounded in Lake George Scott. The water can then be discharged into the Tekapo Canal via Gate 17 or water can flow over the Lake George Scott Weir and continue down the Takapō River to Lake Benmore. Figure 16 shows water spilling across the Lake George Scott weir.

Figure 14: Gate 16 Radial Gates

Figure 15: Lake George Scott

Figure 16: Lake George Scott Weir operating during a release to the Takapō River

The Takapō River is approximately 45 kilometres long and is augmented by spring fed flows and tributaries such as Fork Stream, the Grays River and Mary Burn. The Takapō River converges with the Pūkaki River before discharging into the Haldon Arm of Lake Benmore.

The flow regime of the Takapō River has been modified by the Tekapo PS whereby the majority of the outflow from Takapō is diverted for electricity generation in the Tekapo A and B power stations.

Tekapo Control Structure / Gate 16

Genesis is authorised to discharge up to 850 m^3/s of water from Takapō into the Takapō River via Gate 16. Typically, water is only released into the Takapō River downstream of Gate 16 in the following circumstances:

1. When the maximum operating level of Takapō has been reached and the capacity of the Tekapo PS is not sufficient to reduce the level of Takapō; or
2. To enable electricity generation at the Tekapo B Power Station if there is an outage event at the Tekapo A Power Station; or
3. For recreational release purposes; or

4. To top-up Lake George Scott with the purpose of storing water to enable uninterrupted generation from Tekapo B Power Station in case of the loss of generation at Tekapo A, or in rare circumstances, to augment Tekapo B generation capacity; or

5. When requested by the National Grid Operator ("**Transpower**") to "island" Tekapo A Power Station, by restricting generation at, and diverting water around, Tekapo A Power Station during transmission network maintenance or faults, isolating Tekapo A Power Station from the grid but enabling the continued supply of electricity to the Tekapo township, Fairlie, Albury and Mt Cook areas.

Lake George Scott Control Weir

Genesis typically operates Lake George Scott to a maximum level of 684.05 masl, being the level of the spill crest of the weir. Water levels greater than this will flow to the Takapō River.

Genesis is authorised to release water into the Tekapo Canal via Gate 17 (see Figure 17) in the Lake George Scott control structure, or to discharge up to 600 m^3/s of water into the Takapō River over the Lake George Scott Weir.

Figure 17: Gate 17, Tekapo Canal

The release of water from the Lake George Scott Weir to the Takapō River is presently managed in accordance with the provisions contained in the Flood Rules.

Figure 18 provides an overview of the "top" section of the Tekapo PS, including the general location of the Tekapo A Power Station and intake, Gate 16, Lake George Scott, Gate 17, the Lake George Scott Weir and the Tekapo Canal:

Figure 18: Tekapo Power Scheme and the Upper Takapō River

2.5 TEKAPO A POWER STATION INTAKE

Situated on the southern foreshore of Takapō, the intake structure for Tekapo A Power Station draws water for the power station and passes it through a six metre diameter, 1.4 kilometre long tunnel. This intake structure is located in the bed of Takapō to the west of Tekapo township and is shown in Figure 19.

Figure 19: Tekapo Intake Structure

Genesis has recently completed an upgrade to the intake structure. The $26.5m Tekapo Intake Gate Project took two years of construction to complete. The 50-tonne gate is designed to stop inflows from Takapō in the advent of a serious emergency, such as a 1 in 10,000-year earthquake (Richter scale 7+), and thereby protect the Tekapo PS infrastructure from potentially uncontrollable water flows.

The tunnel terminates in a surge chamber which is designed to accommodate flow differences when the power station operation requires flows to change faster than what the flow in the tunnel can accommodate.

2.6 TEKAPO A POWER STATION

Construction of the Tekapo A Power Station began in 1938 and was commissioned in 1951 with generation capacity of 27MW.

In 2014 Genesis completed a significant upgrade to increase the generation output from the Tekapo A Power Station. This upgrade involved replacing the Tekapo A generator stator and installing new rotor poles. This increased the generator rating from 28 MVA to 35 MVA and allowed for the overall up rating of station output from 27MW to 30MW using the same volume of water.

Tekapo A Power Station (30MW) generates an average of 160 GWh of electricity per year from water diverted from Takapō and is shown in Figure 20 (power station) and Figure 21 (Tekapo A Power Station turbine hall).

Figure 20: Tekapo A Power Station

Figure 21: Tekapo A Power Station Turbine Hall

2.7 TEKAPO CANAL

Outflows from Tekapo A Power Station enter the 25.5 kilometre long Tekapo Canal, which has a maximum capacity of 130 m^3/s. The Tekapo Canal was constructed in 1970 and is shown in Figures 8, 9 and 20 above and Figure 22 below.

Water from Takapō can be released into the Tekapo Canal via Gate 17 at Lake George Scott. This water has bypassed Tekapo A Power Station by being released through Gate 16 and flowing down the upper Takapō River to Lake George Scott.

Figure 22: Tekapo Canal

The Tekapo Canal passes over a number of natural waterways which pass under the canal through culvert structures, including Forks Stream, Irishman Creek and Mary Burn. The water in the canal flows into a head pond before entering the penstocks and Tekapo B Power Station. An overview of the location of the Tekapo Canal route is shown by the red line on Figure 23.

When Genesis purchased the Tekapo PS in June 2011, preparations were made to develop a solution to repair leakage from some sections of the Tekapo Canal. The canal had been known to leak for many years since it was built. Some of these leaks had deteriorated, requiring remedial action. Genesis' solution was to re-line sections of the canal with a canal liner imported from Europe. Lining repair works being undertaken are shown in Figure 24.

The liner is a specialised PVC material that will withstand various pressures and sunlight for many years. Three sections of the Tekapo Canal were repaired over two construction seasons. The total length of canal repaired was 6.3 km (at a cost of approximately $125 million). Up to 185 workers were on the construction site during each of the two construction seasons to complete the works, consisting of Genesis staff and international, national and local contractors.

Figure 23: Tekapo Canal Route (red line)

Figure 24: Tekapo Canal Lining Works

2.8 TEKAPO B POWER STATION

Two Francis turbines drive two 80 MW generators at Tekapo B Power Station. Water is discharged up to a maximum rate of 130 m^3/s into Lake via the Tekapo B Power Station. This same water is then available for storage in Lake Pūkaki or for further generation as

it passes through a further six Meridian owned power stations within the Waitaki Catchment, three of which (Ōhau A, Ōhau and Ōhau C stations) would not otherwise be able to generate electricity from water derived from Takapō.

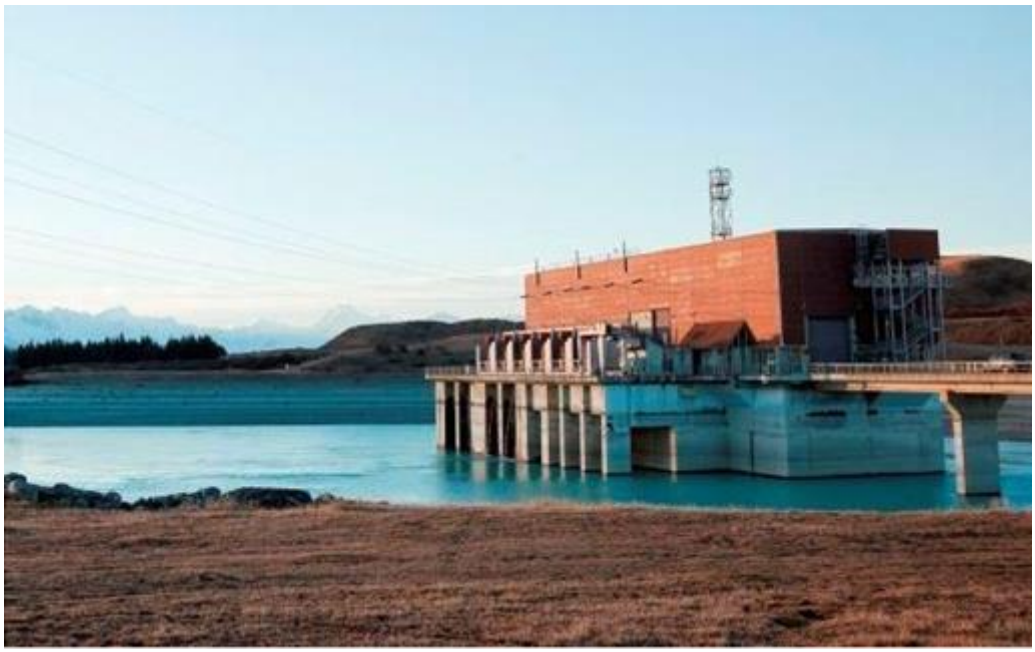

Figure 25: Tekapo B Power Station

Commissioned in 1977, Tekapo B Power Station (160 MW) is the only power station in New Zealand surrounded by water. Sitting in Lake Pūkaki, essentially as an island, the station is connected to land via a 74-metre long bridge. Constructed on concrete raft foundations, Tekapo B is 46 metres high. However, nearly two thirds of the power station is below the waterline.

A $15+ million upgrade project to install new turbine runners and to refurbish generators, headgates and transformers at the Tekapo B Power Station completed in early 2022 has delivered a 2.5+ per cent efficiency gain and further enhanced the long-term reliability and performance of the station, future proofing Tekapo B Power Station for years to come.

2.9 ROLE OF THE TEKAPO POWER SCHEME IN NEW ZEALAND'S ELECTRICITY SUPPLY SYSTEM

Electricity is vital to virtually every aspect of modern life. Electricity accounts for over a quarter of annual energy consumption, second only to oil which dominates the transport sector, among sources of energy. Many industrial, commercial and domestic activities are dependent on electricity and, as the economy grows, the demand for electricity grows. Similarly, many of the social and economic benefits enjoyed in New Zealand stem directly from technologies relying on electricity. Electricity is becoming even more

important as New Zealand moves to decarbonise the economy using renewable generation sources.

The Courts have long confirmed the essential place of electricity in New Zealand, for example:[96]

> Electricity is a vital resource in New Zealand. There can be no sustainable management of natural and physical resources without energy, of which electricity is a major component.

The role of the Tekapo PS in New Zealand's electricity supply system is discussed in the Concept Consulting Ltd report[97] ("**Concept 2025**"). This report is attached as **Appendix G** to this AEE.

The combined WPS contributes (on average) more than 7,500 GWh of electricity per annum, approximately 25% of total annual supply requirements, and more than half of the South Island annual electricity demand. The lakes forming part of the combined WPS typically provide up to 65% of New Zealand's controllable hydro storage capacity. In terms of the Tekapo PS specifically, the scheme generates on average 1,870 GWh per annum 100% renewable electricity, enough to power approximately 121,000 households per year directly, or indirectly,[98] approximately 228,000 Canterbury households (more than 90% of the occupied private dwellings in Canterbury).

Water entering upper components of the WPS is utilised at several power stations including the Ōhau A, B and C stations that would otherwise not receive water from the Takapō catchment. The Tekapo PS therefore generates proportionally more energy than water that enters lower down the catchment. In that regard, the water entering the catchment upstream of the Tekapo A power station provides approximately 25 times more potential energy supply than water entering upstream of the Waitaki Power Station (for example). The majority of inflows to the Waitaki catchment enter the upper reaches of the catchment via Takapō, Lake Pūkaki and Ōhau.

In terms of the electricity market, demand for electricity is not constant through the day or across seasons. Daily demand in New Zealand typically varies between a minimum level of around 3300 MW and a peak of 6200 MW – a variation of almost 90 percent between peak and trough (Concept 2025). The highest peak daily demand occurred on 9 August 2021, with a maximum daily peak of 7,122 MW.[99]

---

[96] *Genesis Power Limited v Franklin District Council* [2005] NZRMA (EC) at page 556

[97] Tekapo Power Scheme – electricity sector benefits, 2025. Prepared by Concept Consulting Ltd.

[98] Including generation in Meridian power stations using water that has passed through the Tekapo PS.

[99] The Whakamana i Te Mauri Hiko Monitoring Report, Transpower, October 2024.

These changes in demand require the electricity system to have access to flexible supply sources that can be turned on and off quickly to ensure that the grid remains balanced. The physical characteristics of electricity mean that demand and supply must be matched on a continuous basis because any mismatch of generation and load causes the power system frequency to slow or speed up. A mismatch, if not corrected quickly, can cause the progressive trips of power stations and potentially power black outs.

The WPS is a flexible source of baseload electricity generation with a major associated storage catchment. It is readily able to respond to electricity market requirements, increasing and decreasing output to follow the daily pattern of electricity demand. This important role is typically provided by hydro schemes with storage and/or thermal / geothermal power stations with energy storage capability and flexible fuel supply arrangements. The output of the Tekapo PS (and other stations comprising the WPS) can be readily increased to generate more at times of peak demand: while the combined WPS provides up to 25% of New Zealand's annual electricity demand, the scheme can contribute up to 24% of New Zealand's peak demand. Additionally, the Tekapo PS (and the other schemes comprising the WPS) can increase generation (providing water is available) more quickly than some thermal power stations where it can take serval hours to start up.

Because overall hydro storage capacity is limited in New Zealand, seasonal storage within the combined WPS fills a particularly important role. The combined WPS provides up to 65% of New Zealand's storage capacity. Without this capacity, managing the risk of electricity shortages during droughts would require significantly greater levels of thermal generation or energy storage elsewhere.

In addition, the Tekapo PS provides critical ancillary services to the New Zealand electricity system including spinning reserve where the generating units are able to respond quickly to faults elsewhere in the national electricity system to maintain the voltage and frequency, preventing a system collapse. The Tekapo A and B stations also provide voltage support which is critical to the upper South Island 220kV transmission system and the local South Canterbury 110kV network. Tekapo A can also run in Islanded mode where it can supply power to just the local area from Albury to Mt Cook and is also capable of providing a Black Start service to the National Grid Operator Transpower when there are faults on this local network as well.

As with most hydro-electricity schemes, even small reductions in the amount of water that can be used by the Tekapo PS can have large effects on the electricity market as a whole. To demonstrate this, various modelling assessments have been undertaken to assess the effects of minimum flows or diversions of water for other purposes or activities on the electricity potential of a hydro scheme. For example, Concept Consulting prepared a report in 2013 for the Ministry for the Environment entitled *Evaluation of*

potential electricity sector outcomes from revised minimum flow regimes on selected rivers. The assessment found:

a. Increasing the minimum flow requirements on rivers used for electricity generation will impose costs on the electricity system as measured by a number of potential metrics:

b. Whole-of-New Zealand resources cost implications (i.e., the economic cost implications) arising from the need to replace lost hydro generation with non-hydro generation, thereby incurring the associated fuel, carbon dioxide, capital and operating costs; and

c. Increases to consumers electricity bills.

The increased costs come from two phenomena:

i. Reduced diversions into rivers used for electricity generation arising from increasing the minimum flow requirements in waterways from which water has been diverted; and

ii. A loss of flexibility for hydro generators to store water at low value times for use at high value times.

A reduction in hydro generation is not readily replaced by wind or solar generation as these require generation that is not weather or sunlight dependent, such as is provided by hydro, geothermal and thermal (particularly in the short to medium term) generation. A reduction in hydro generation may therefore result in an increased reliance on thermal generation and would not be consistent with meeting the increase required in renewable electricity that is forecast to be required over the coming years.

The Tekapo PS provides a significant national benefit to New Zealand electricity consumers by avoiding electricity price increases that would occur if the scheme needed to be replaced. Replacing the Tekapo PS would result in more expensive generation (mostly thermal generation and demand response) being required in the short term and in the long term, the development of more expensive renewables would be required Concept 2025 estimates that this would equate to a present value increase in costs to consumers of approximately $9.2 billion.

Concept 2025 estimate that replacing the Tekapo PS output with alternative renewable sources would impose additional costs on New Zealand society of around $170 to $220 million per year. Furthermore, it would take time to construct the alternatives, creating a need for increased thermal generation in the meantime. The annual costs for that generation would be approximately $250-$370 million per year. Increased thermal generation would also significantly raise New Zealand's greenhouse gas emissions, by the equivalent of 450,000 to 1.13 million cars per year while it was operating.

2.10 EXISTING RESOURCE CONSENTS

Genesis' existing resource consents are subject to a range of conditions, including specifying lake levels consistent with those required under the WAP. The conditions also require compliance with Flood Rules specified in Appendix A to the consents.

In addition to the specific consent condition requirements, Genesis is also a party to agreements relating to various ongoing mitigation measures.

Table 11 summarises the key Tekapo PS resource consent requirements.

It is noted that the discharge rates identified in Table 11 are the rates the structures are designed for and do not necessarily reflect actual discharge rates. The "minimum control level" of 702.1 m for Takapō represents an "operational" control level rather than the statutory minimum lake level specified in the WAP. The purpose of the operational control level is to reduce the likelihood of the statutory minimum lake level being reached.

Table 11: Summary of Key Tekapo PS Resource Consent Obligations

Location	Consent requirements	Operating rules
Takapō	Minimum lake level: 701.80m (April - Sept), 704.10m (Oct – March, with emergency relief) Maximum lake level: 710.90m Recreational releases for kayaking	Design flood level (DFL): 713.05m Maximum control levels ("**MCL**") by month: between 709.70m and 710.90m Minimum control level: 702.10m Extreme minimum control level: 701.8m Various discharge rate controls, including minimum discharges when above MCL
Takapō River	Maximum discharge from Tekapo Control Structure: 850 m^3/s Maximum diversion to Tekapo Canal: 130 m^3/s	
Lake George Scott	Maximum lake level: 684.05m Maximum discharge to Takapō River: 600 m^3/s	Takapō River discharge change rate controls
Tekapo A Power Station	Maximum take: 130 m^3/s Maximum use: 130 m^3/s	

Location	Consent requirements	Operating rules
Tekapo B Power Station	Maximum use: 130 m^3/s Maximum discharge: 130 m^3/s	

2.11 MITIGATION / COMPENSATION AGREEMENTS

As detailed earlier, Genesis' existing resource consents were granted under the Water and Soil Conservation Act 1967 and are therefore "deemed resource consents" under the RMA. These consents do not include specific conditions requiring adverse effects to be mitigated. Instead, these are set out in a series of agreements negotiated between previous owners of the Tekapo PS and various stakeholders. Those agreements have created tangible environmental improvements and enhanced stakeholder relationships. A high-level summary of relevant agreements forming part of the present Tekapo PS activities follows.

2.11.1 Mackenzie District Council Agreement

An agreement with MDC covers the provision of funding for the Tekapo community and appropriately managing the effects of Genesis' lake level operations on the Lake Alexandrina causeway and Takapō boat ramps.

2.11.2 Department of Conservation

As detailed in section 1.4, Project River Recovery is a programme established in 1990 that aims to protect or restore rivers and wetland ecosystems in the upper Waitaki Basin. PRR is the largest and longest running programme of its kind in New Zealand and has run an extensive weed eradication program over 35,000 hectares of near pristine river habitat and conducts research into braided river ecosystems. Birdlife in the area has benefited significantly from the PRR programs, with banded dotterels, black front terns, and wrybills successfully hatching and rearing a greater number of young. Technical reviews and assessments of the ecological significance of the PRR operations have shown that it has had tangible environmental benefits.

2.11.3 Central South Island Fish and Game

Genesis has an agreement with Central South Island Fish and Game ("**Fish and Game**") in which Genesis provides Fish and Game with funds to assist with managing, maintaining and enhancing the Tekapo Sports fishery.

Within the Tekapo Sports Fishery, Lake Alexandrina is a significant trout fishery with over 200 fishing huts on its shores and visits by many tourist anglers detouring off the Mackenzie State Highway. Since June 2011, Genesis has provided Fish and Game with

funds to manage the Lake Alexandrina Fishery Enhancement Project. This work has been underway since the 1980s to maintain and enhance the brown and rainbow trout fishery by improving spawning habitat in the lakes only inflowing stream, Scott's Creek, as well as the lake's outflow, Outlet Creek.

2.11.4 Tekapo Whitewater Trust / Whitewater New Zealand Agreement

The mitigation agreement makes available flows specifically for recreation in the Takapō River and Tekapo slalom course. The agreement also makes available funding for maintenance and upgrades to the Tekapo slalom course.

2.11.5 Future Agreements

The agreements identified above are being updated as part of this application process including by re-confirming the scope of the agreements (with changes as considered necessary by the parties involved) and the funding for the various activities.

A new compensation agreement with DoC and Meridian includes a biodiversity fund for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment.

Genesis also has a new agreement with Fish and Game to provide funding with respect to the Tekapo Sports Fishery and to implement a sports fish salvage plan if sports fish are stranded as a result of the Tekapo PS operations. In addition, Genesis will use all reasonable endeavours to retain current vehicle access and non-motorised public access to those parts of the lakes and canals comprised in the Tekapo PS within Genesis' control where it is safe to do so.

Genesis has discussed the application with the Trustees of the Tekapo Whitewater Trust, and with Whitewater NZ Incorporated, focusing on the operation of the Tekapo PS and recreational releases of water. Through this discussion, Genesis has reached agreement with Tekapo Whitewater Trust / Whitewater NZ on recreational matters. Conditions relating to recreational water releases[100] are incorporated into the proposed conditions in **Appendix D**. A letter of support from the Trustees of the Tekapo Whitewater Trust, and Whitewater NZ Incorporated is included in **Appendix T**.

2.12 OTHER AGREEMENTS

Genesis has entered into various other agreements relating to the Tekapo PS operations that do not directly involve matters that are the subject of these resource consent

[100] See proposed Schedule One General Conditions 24 and 25.

applications but are important in terms of how the scheme is operated and the ancillary benefits that the scheme supports. Examples of these agreements include the following.

2.12.1 Mount Cook Alpine Salmon

Mount Cook Alpine Salmon ("**MCAS**") has been operating salmon rafts (subject to resource consents held by MCAS) in the downstream end of the Tekapo Canal since 1995 with 10 rafts (prior to 2011, under Meridian Energy's ownership). When Genesis took ownership of the canal in 2011 a further raft was added to bring the total to 11, with a total length of approximately 1630 m. In 2018, the first five upstream rafts were removed from the salmon farm, and replacement rafts installed in the Tekapo B headpond to address a hydraulic restriction in the Tekapo Canal.

MCAS hold resource consents relating to the salmon farming operations and must manage their operations in accordance with the resource consent requirements and a lease agreement with Genesis. Granting the resource consents sought by Genesis will not affect the exercise of the MCAS consents but will support the MCAS operations and provide them with greater certainty regarding their existing investment and future operations using the Tekapo Canal.

2.12.2 Mackenzie Irrigation Company Agreement

The Mackenzie Irrigation Company ("**MIC**") Agreement was signed by Meridian Energy and MIC in 2006 and provides 150 million cubic metres of water per annum to be taken and used within the upper Waitaki Catchment for 'new' irrigation (that is, not Existing Water Rights in effect as of 11 September 2003). This represents approximately 25,000 hectares of new irrigation in the upper Catchment. Genesis became a party to the MIC Agreement following the acquisition of the Tekapo PS in 2011. The resource consents sought by Genesis will not affect the MIC agreement.

2.12.3 New Zealand Transport Agency

Genesis also has an agreement with the New Zealand Transport Agency (Waka Kotahi) relating to management of activities potentially affecting each party's land and assets. The agreement does not affect the exercise of the Tekapo PS resource consents.

2.13 FUTURE OPERATING REGIME – PEAK INFLOWS

For the avoidance of doubt, Genesis is not seeking any alterations to the current operational parameters associated with the ongoing operation of the Tekapo PS apart from an adjustment to the flood operating rules that is required in order to protect the integrity of the Tekapo PS structures. This change does not change the lake levels that form the basis of the rules, rather, the flow rates required to achieve the specified lake levels have been reassessed using extensive and updated data and modelling.

Peak flows for the Tekapo PS are dominated by Takapō as this is the most significant source of flood inflows. The Takapō River is the natural outlet for Takapō, with outflows from the lake managed via the Lake Tekapo Control Structure (Gate 16). Management of flood events is focused on the operation of Gate 16 to provide safe passage of flood events through the system without presenting an undue risk to people, property, infrastructure (Genesis owned and otherwise), and the environment.

Currently, Gate 16 is operated in accordance with a set of flood rules which set a minimum discharge from Takapō as a function of the lake level once it reaches MCL as described in the Flood Rules (Appendix A to the existing resource consents).

The current Tekapo flood rules prescribe a minimum discharge from Takapō as a function of the lake level above MCL; as the lake level increases further above MCL the minimum discharge requirement increases. An adjustment to the flood rules to change the minimum discharge requirements is proposed to protect the integrity of the Tekapo PS structures.

The changes to the flood rules will not have any implications in terms of the WAP provisions for existing activities (i.e., changes to the flood rules will not change the activity status for these applications) but will provide an effective management tool for achieving the limits specified in the WAP during peak inflow events.

The key resource consent obligations detailed in Table 11 above form the basis of the conditions proposed in **Appendix D** as part of this resource consent application. Provision for establishing modified flood rules have also been incorporated into the proposed conditions.

3. RESOURCE CONSENT REQUIREMENTS

3.1 OVERVIEW

Genesis is seeking two resource consents under the FTA to replace resource consents for the damming of the Takapō River, the taking and diversion of water from Takapō and the Takapō River, and the discharge of water and associated contaminants into Lake Pūkaki and the Takapō River from Tekapo PS operations that expire in 2025. The replacement consents will enable the continued operation of the Tekapo Power Scheme. Genesis is not proposing any material changes to the hydrological regime associated with the Tekapo PS. Certificates of title and deed of easement documents relevant to the scheme are provided in **Appendix H**.

While consent is being sought under the FTA, an analysis of the rules in the CRC regional plans relevant to the two resource consents being sought is provided in the sub-sections below.

3.2 CANTERBURY REGIONAL COUNCIL JURISDICTION

The RMA activity status for the activities relating to the ongoing operation of the Tekapo PS is determined by the WAP and CLWRP.

3.2.1 Waitaki Catchment Water Allocation Regional Plan

3.2.1.1 Primary Activities

Rule 15A of the WAP sets out that:

> Any activity that is part of the Waitaki Power Scheme, for which a consent is held and is the subject of an application for a new consent for the same activity and is:
>
> (a) the use of water for the generation of electricity; or
>
> (b) the taking, damming or diverting of water for storage; or
>
> (c) the taking or diverting of water into canals; or
>
> (d) the taking, damming, or diverting of water to protect the structural integrity of dams, power houses, canals and appurtenant structures;
>
> is a controlled activity, provided the activity complies with **Rules 2, 3, 6 and 7**.

Rule 2 requires that no person shall take, use, dam or divert surface water, unless:

a. The flow in the relevant river or stream, or the level in the relevant lake, is above the minimum flow or level in Table 3B. Table 3B specifies that for the Takapō River:

i. An allocation limit from Lake George Scott to the confluence with the Grays River of 0 m^3/s;

ii. From the Fork Stream confluence to Lake Benmore, a minimum flow of 3.4 m^3/s measured immediately downstream of the Mary Burn confluence;

iii. An allocation limit from downstream of the Grays River confluence to Lake Benmore of 0.7 m^3/s; and

iv. Any taking of water that has been released into the Takapō River from Lake George Scott for agricultural and horticultural activities is in addition to the allocation limits above.

The ongoing operation of the Tekapo PS complies with the flow regime for the Takapō River and does not involve an allocation from the Grays River. It will not reduce the flow downstream of the Fork Stream below 3.4 m^3/s, nor does it involve any taking of water that has been released into the Takapō River from Lake George Scott.

b. The amount of water taken or diverted from the relevant river or stream is for a replacement consent or in combination with the amount of water authorised to be taken by existing resource consents, does not exceed the allocation limits in Table 3B.

As detailed above, the ongoing operation of the Tekapo PS complies with the allocation for the Takapō River.

c. The take or diversion complies with a flow-sharing regime such that no more than half of the water above or between the thresholds in Table 3B can be taken or diverted.

There is no flow sharing regime for the Takapō River.

Rule 3 sets out that no person shall take, use, dam or divert water from the lakes in Table 4 or from the canals leading from the lakes in Table 4 of the WAP unless the level in the relevant lake is above the minimum lake level in Table 4. The rule also provides that a temporary reduction in lake level, below the minimum lake level specified in Table 4, for the purposes of maintenance or rehabilitation of electricity generation infrastructure is exempt from the minimum lake levels specified. Genesis is proposing a continuation of the current operating regime for Takapō (including for the taking of water from the lake) which is compliant with Rule 3.

Finally, Rule 6 requires that no person shall take, use, dam or divert water, if the take, by itself or in combination with any other take, results in the sum of the annual volumes authorised by those resource consents, exceeding the annual allocation to that activity

in Table 5 of the WAP. Table 5 allocates "all other inflows"[101] of Takapō to hydro-electricity generation. The ongoing operation of the Tekapo PS therefore meets the requirements of this rule.

Rule 15A also specifies that it relates to the activities for which current resource consents are held and are being replaced as part of the application. In that regard, Table 12 provides a further overview of the activities for which consent is sought, the applicable rule in the WAP and the existing resource consent or consents that is being replaced to confirm the controlled activity rules applies to the activities for which replacement resource consents are being sought.

No consent is sought to replace diversion consents CRC905310.2, CRC905311.2, CRC905313.2, CRC905314.2, CRC905315.2, CRC905316.2, CRC905317.2, CRC905318.2, and CRC083496.1 as the diversions now form part of the modified bed of the respective waterways.

Table 12: WAP Rules and Existing Consents

Activity	Purpose / Location	Rule	Consent Being Replaced
To Dam, Take, Divert and Use Water	To Dam the Takapō River at the Lake Tekapo Control Structure to Control and Operate Takapō Levels. To Dam the Takapō River at the Lake George Scott Control Weir to Control and Maintain Lake George Scott Levels. To Take, Divert and Use Water from the Takapō River via the Tekapo Canal Control Structure (Gate 17). To Take, Divert and Use Water from Takapō via the Tekapo Intake for the generation of electricity, and ancillary purposes, at the Tekapo A and B Power Stations	WAP Rule 15A: (a) the use of water for the generation of electricity; or (b) the taking, damming or diverting of water for storage; or (c) the taking or diverting of water into canals; or (d) the taking, damming, or diverting of water to protect the structural integrity of dams, power houses, canals and appurtenant structures.	CRC183551 CRC905302.3 CRC905305.2 CRC905319.2 CRC905306.3 CRC905307.2 CRC905308.2

[101] Rule 6 also identifies allocations for "*Town and Community water supplies*", "*Industrial and commercial activities (outside municipal or town supply areas)*", "*Tourism and recreational facilities*" and "*Agricultural and horticultural activities*".

3.2.1.2 Ancillary Activities

Genesis takes water for domestic supply to the power stations and undertakes "fish salvage" activities around Tekapo PS infrastructure. Historically, the Tekapo Canal also resulted in diversions of water when the canal was built. Resource consent requirements for these activities are summarised as follows:

1. **Domestic water take:** Genesis has separately been granted consent (consent number CRC241956) to use up to 8 cubic metres of water per day from the Tekapo Canal[102] for kitchen, toilet and other consumptive purposes at the Tekapo A and Tekapo B power stations. Resource consent CRC241956 expires on 1 February 2059.

2. **Taking of water for fish salvage:** the CRC has confirmed to Genesis that no resource consents are required for works associated with fish salvage in and around infrastructure.

3. **Diversions:** the CRC has confirmed to Genesis that since the diversion works have been completed and the activities are now provided for by permitted activity rules in the WAP and CLWRP or the culverts now form part of the bed of the waterway and are effectively a modified bed, rather than a diversion of water, no resource consents for diversions are necessary.[103]

3.2.2 Canterbury Land and Water Regional Plan

3.2.2.1 Primary Activities

Rule 5.125A of the CLWRP sets out that:

> Despite other discharge rules in this Plan, the discharge of contaminants or water onto or into land in circumstances where contaminants may enter surface water, or into surface water, associated with an activity that is part of the Waitaki Power Scheme, for which a resource consent is held and is the replacement of authorisation for a lawfully established existing discharge affected by the provisions of sections 124 – 124C of the RMA, and the discharge is:
>
> (a) generation and release water from dams and power houses; or
>
> (b) from water storage; or
>
> (c) into or from canals; or

---

[102] The water used under this permit may only be that taken under water permits CRC905302.3 (Lake Takapō) and CRC905308.2 (Takapō River) (or any subsequent variation or replacement consent thereof).

[103] Email confirmation from Z Smith (CRC) to J Page (Meridian), A Barnett (Genesis) and N Reuther (CRC) dated 2 May 2022, subject: Flood flows and Diversions – Ecan current position.

(d) to protect the structural integrity of dams, power houses, canals and appurtenant structures;

is a **controlled activity**, provided the following condition is met:

1. The discharge does not cause the relevant water quality limits set out in Section 15B of this Plan, or in the absence of any water quality limits in Sections 15B the limits set out in Schedule 8 of this Plan, to be exceeded.

The water quality limits in section 15B are specified in Table 15B(c) – Water Quality Limits for Waitaki Rivers and Table 15B(d) – Water Quality Limits for Lakes in the Upper Waitaki Freshwater Management Unit.[104]

The ongoing operation of the Tekapo PS will not cause any of these water quality limits in section 15B of the CLWRP to be exceeded.

As with the controlled activity rule in the WAP, Rule 5.125A of the CLWRP specifies that it relates to the activities for which current resource consents are held and are being replaced. Table 13 provides a further overview of the activities for which consent is sought, the applicable rule in the CLWRP and the existing resource consent or consents being replaced to confirm the controlled activity rules applies to the application.

Table 13: CLWRP Rules and Existing Consents

Activity	Purpose / Location	Rule	Consent Being Replaced
To Discharge Water and Associated Contaminants	To Discharge Water and all associated Contaminants into Lake Pūkaki via the Tekapo B Tailrace. To Discharge Water and all Associated Contaminants into the Takapō River from the Lake Tekapo Control Structure for the Purpose of Spilling Water, to Bypass Tekapo A, for Lake George Scott Water Level	CLWRP Rule 5.125A (a) generation and spill water from dams and power houses; or (b) from water storage; or (c) into or from canals; or	CRC905320.2 CRC905304.3 CRC905309.4

[104] The Takapō River water quality limits in Table 15B(c) are for dissolved reactive phosphorus (Annual Median 0.002 mg/L), nitrate-nitrogen (upstream of Grays River Annual Median 0.017 mg/L, 95th Percentile 0.097 mg/L; Steel Bridge Annual Median 0.016 mg/L, 95th Percentile 0.144 mg/L) and ammoniacal nitrogen (upstream of Grays River Annual Median 0.005 mg/L, Annual Maximum 0.029 mg/L; Steel Bridge Annual Median 0.005 mg/L, 95th Percentile 0.31 mg/L). For Takapō and Lake Pūkaki, the water quality limits in Table 15B(d) are for trophic level index (maximum annual average, 1.7), total phosphorus (Annual Median <10 mg/m^3), total nitrogen (Annual Median <160 mg/m^3), chlorophyll-a (Annual Median <2 mg/m^3, Annual Maximum <10 mg/m^3) and ammoniacal nitrogen (Annual Median <0.03 mg/L, Annual Maximum 0.05 mg/m^3).

Activity	Purpose / Location	Rule	Consent Being Replaced
	Maintenance and for Recreational Release Purposes. To Discharge water and all associated contaminants into the Takapō River from the Lake George Scott Control Weir for the Purpose of Spilling Water.	(d) to protect the structural integrity of dams, power houses, canals and appurtenant structures	

3.2.2.2 Ancillary Activities

The Tekapo PS has been operating for many years under a mix of resource consent and permitted activity authorisations. Genesis holds a range of resource consents and certificates of compliance for other "ancillary" activities contributing to the operation of the Tekapo PS. There are also other activities for which resource consent is not required as the activity meets the performance standards of various permitted activity rules. These resource consents and other authorisations include:

1. **Dams**: Rule 5.158 of the CLWRP sets out that "*the use and maintenance of a lawfully established dam that existed on 1 November 2013*" is a permitted activity. There are no conditions associated with this rule. As the dam structures associated with the Tekapo PS were lawfully established and existed on 1 November 2013, the dam structures are permitted.

2. **Stormwater**: Genesis holds resource consent CRC220340 authorising the discharge of stormwater from the Tekapo PS to surface water in accordance with Rule 5.97 of the CLWRP. This consent expires on 22 October 2056.

3. **Diversions:** the CRC has confirmed to Genesis that since the diversion works have been completed and the activities are now provided for by permitted activity rules in the WAP and CLWRP or the culverts now form part of the bed of the waterway and are effectively a modified bed, rather than a diversion of water, no resource consents for diversions are necessary.[105]

4. **Drainage Water**: All station drainage water that emanates from inside the Tekapo A and B Power Stations drains via the station sump which directs this drainage water to an oil interception system located at each station. The discharge of the "water containing contaminants" is authorised by resource consents for each of Tekapo A and B Power Stations (CRC950297.2 and CRC950298.2 respectively).

[105] Email confirmation from Z Smith (CRC) to J Page (Meridian), A Barnett (Genesis) and N Reuther (CRC) dated 2 May 2022, subject: Flood flows and Diversions – Ecan current position.

Monitoring undertaken by Genesis has demonstrated that the conditions of the consents have been complied with and no aspects requiring change have been identified by Genesis, CRC or any other party. Genesis intends to continue to exercise these consents for their authorised duration and will apply for replacement consents as appropriate before they expire on 4 October 2030. As part of the consent replacement process for CRC950297.2 and CRC950298.2, Genesis will review the monitoring that has been undertaken and the best practicable option for any continued discharge beyond the expiry of the present consents.

5. **Cooling water**: Cooling water for the main generator and transformer units at both stations is discharged directly to the tailraces. These cooling water discharges are permitted activities in accordance with Rule 5.99 of the CLWRP. The discharge complies with the permitted activity standards as follows:

   5.99(1): The discharge is not from or into contaminated or potentially contaminated land; and

   5.99(2): The discharge is not into a Natural State water body; and

   5.99(3): The discharge meets the water quality standards in Schedule 5 of the CLWRP after reasonable mixing with the receiving waters, in accordance with Schedule 5, including the requirement that after reasonable mixing, the temperature increase resulting from a discharge shall not exceed 2°C which discharges for both stations fall within; and

   5.99(4): The concentration of total suspended solids in the discharge do not exceed 100 g/m^3, being the requirement for any discharge to a river or to an artificial watercourse; and

   5.99(5): The discharge does not result in more than a 20% change in the rate of flow of the receiving surface water body; and

   5.99(6): The discharge does not contain any hazardous substance, hazardous waste or added radioactive isotope.

6. **Domestic wastewater**: A wastewater treatment discharge consent was obtained in 2013 for wastewater discharges from the Tekapo A Power Station (CRC142466). The discharge now complies with the permitted activity rules in the CLWRP (5.7 and 5.8) and is identified in the CRC consents database as being a permitted activity, so no consent is required. For the wastewater discharged from Tekapo B, the current system has been in place since 1977. However, no wastewater is discharged from this system. Rather, a sucker truck is brought on-site as needed to remove the septic tank material which is then discharged at an authorised

facility off-site. This activity therefore does not require consideration under the CLWRP as there is no discharge to land or water.

7. **Maintenance**: the use and maintenance of structures associated with the Tekapo PS (excluding dams) on, in or under the bed of a lake or river (such as the culverts within the streams under the Tekapo Canal) is a permitted activity in accordance with Rule 5.139 of the CLWRP or is otherwise authorised by resource consents CRC111740, CRC111762, CRC111767 and CRC111768 which expire on 13 October 2038.

   The discharge complies with Rule.139 permitted activity standards as follows:

   5.139(1): The structures have been lawfully established; and

   5.139(2): Any material deposited in, on, under or over the bed in order to maintain the structure is of inert materials of colour and material type that blends with the surrounding natural environment and is not contaminated with any hazardous substance; and

   5.139(3): Any upgrading or minor alteration undertaken in accordance with this rule does not increase the footprint, height, or external envelope of the structure; and

   5.139(4): Except for bridges, culverts, pipes, ducts, cables and wires and their associated support structures the maintenance of that part of the structure within the bed of a lake or river is not undertaken within a salmon spawning site or in any inanga spawning habitat during the inanga spawning season of 1 March to 1 June inclusive, or in any Critical Habitat.

8. **Intake Boom**: Genesis currently holds resource consents CRC221514 and CRC221714 (expiring on 18 November 2029) which enabled the removal of the existing boom around the Lake Tekapo Intake and the use, erection, and placement of a replacement safety boom on and over the bed of Lake Tekapo. The previous safety boom had been in place for several years with the purpose of excluding public from the vicinity of the Intake. An upgraded boom to further deter anyone from accessing the Intake Structure and to further delineate the area around the Intake has been installed.

9. **Seeps from Tekapo Structures**: The Tekapo Canal and Lake George Scott have seepage points, where the canal or structure has not been lined. Such minor discharges are permitted activities and meet the performance standards of Rule 5.99 of the CLWRP as follows:

   5.99(1): The discharges are not from or into contaminated or potentially contaminated land; and

5.99(2): The discharges are not into a Natural State water body; and

5.99(3): The discharges meet the water quality standards in Schedule 5 of the CLWRP after reasonable mixing with the receiving waters, in accordance with Schedule 5; and

5.99(4): The concentration of total suspended solids in the discharges do not exceed 100 g/m^3, being the requirement for any discharge to a river or to an artificial watercourse; and

5.99(5): The discharges do not result in more than a 20% change in the rate of flow of the receiving surface water body; and

5.99(6): The discharges do not contain any hazardous substance, hazardous waste or added radioactive isotope.

10. **Water tracers**: Genesis currently holds resource consent CRC157369 which authorises the discharge of tracers into surface water. Water tracers, particularly milk, are used by Genesis for the purposes of detecting leakage points on the external canal embankments and surrounding areas in the Tekapo Canal. The consent has limits on the discharge of water tracers (for example, no more than 100 litres per day of milk can be discharged into the Tekapo Canal). This consent expires on 30 April 2025 and does not form part of the replacement resource consents being sought by Genesis. A separate resource consent application will be lodged with CRC should Genesis determine that this consent needs to be replaced.

3.3 MACKENZIE DISTRICT COUNCIL JURISDICTION

The Mackenzie District Plan ("**MDP**") includes a specific self-contained suite of rules for Tekapo PS activities within scheduled areas (which are mapped in the MDP).

Under the scheduled activities rules, the operation, maintenance, refurbishment, enhancement and upgrade of the Tekapo A and B Power Stations and water control structures are permitted activities except for where significant external modifications are involved.

The activities associated with the ongoing operation of the Tekapo PS:

a. Have existing use rights; and/or

b. Operate in accordance with a land use consent; and/or

c. Are permitted activities.

While the MDP is currently being reviewed in a series of stages, it is expected to continue to provide for the Tekapo PS activities. Plan Change 26 introduced a new Renewable

Electricity Generation chapter to the MDP which includes a permitted activity rule REG-R1 for the "*operation and maintenance of existing hydroelectric power stations and associated structures*" which is not subject to any specific standards. Decisions on Plan Change 26 were released in July 2024 and are currently subject to four appeals, three of which do not relate to the permitted activity rule and one which seeks to add further indigenous vegetation clearance standards to the rule but otherwise do not challenge the permitted activity status.

Further consideration of the activities under the provisions of the MDP is therefore not required.

3.4 OVERALL ACTIVITY STATUS SUMMARY OF CONSENT REQUIREMENTS

3.4.1 Overall Activity Status

Overall, these applications are a controlled activity under the CLWRP and WAP.

3.4.2 Matters to which Control is Reserved

As a controlled activity, resource consents must be granted, and the conditions able to be imposed are limited to those matters over which control has been reserved, as specified in the relevant planning documents. The additional restrictions on conditions through the FTA also apply. That said, in the case of the Tekapo PS, the specified matters of control are extensive and cover the full gamut of environmental considerations, including:

1. In respect of flows into the Takapō River (above the confluence with the Forks Stream), adverse effects including effects on Ngāi Tahu culture, traditions, customary uses and relationships with land and water;

2. Measures that will ensure any relevant water quality outcomes (freshwater objectives, limits or targets) set out in Sections 15B of the Canterbury Land and Water Regional Plan;

3. Any mitigation measures to address adverse effects on the environment (including effects on Ngāi Tahu culture, traditions, customary uses and relationships with land and water); and

4. Collection, recording, monitoring and provision of information concerning the exercise of consent.

3.5 CONSENT DURATION

Genesis seeks a 35-year consent duration.

The Environment Court has previously considered factors relevant to consent duration in *PVL Proteins Ltd v Auckland Regional Council*[106] (noting that this was within the context of an air discharge permit) including:

1. Whether the term of the resource consent is appropriate in achieving the purpose of the RMA, having regard to the actual and potential effects on the environment and relevant provisions of applicable instruments under the Act (and any other section of the RMA);

2. Conditions may be imposed on the consent requiring adoption of the best practicable option, requiring supply of information relating to the exercise of the consent, requiring observance of minimum standards of quality in the receiving environment, and reserving power to review the conditions;

3. Uncertainty for an applicant of a short term, and an applicant's need (to protect investment) for as much security as is consistent with sustainable management;

4. Expected future changes in the vicinity (which may necessitate a shorter term);

5. Effectiveness of proposed conditions of consent to protect the environment.;

6. Nature of effects: an activity that generates known and minor effects on the environment on a constant basis could generally be granted consent for a longer term, but that one which generates fluctuating or variable effects, or which depends on human intervention or management for maintaining satisfactory performance, or relies on standards that have altered in the past and may be expected to change again in future should generally be granted for a shorter term; and

7. Review conditions that are capable of addressing issues of concern, and potential issues associated with a consent holders' financial ability to implement control.

Given the need for investment certainty associated with the continued operation of the Tekapo PS, Genesis considers that a 35-year consent duration is appropriate for the resource consent applications being sought as part of this application. The reasoning for this is as follows:

(a) Genesis considers that a 35-year duration would be in accordance with the purpose of the FTA and the RMA, having regard to:

[106] PVL Proteins Ltd v Auckland Regional Council EnvC Auckland A61/2001, 3 July 2001.

(i) Actual and potential effects on the environment – these have been assessed in the technical reports as being low or very low in the context of the existing environment;

(ii) Relevant provisions of applicable instruments under the RMA – which are discussed subsequently in this AEE and which largely reflect the current operating parameters for the Tekapo PS;

(iii) With respect to discharges, the nature of the discharges of water to the Takapō River from the Tekapo PS comprise predominantly water from Takapō and have minimal effect; and

(iv) The applicant's reasons for seeking consent, being the need for water to generate electricity for New Zealand and to meet renewable energy and climate change targets.

(b) There has been a high level of environmental compliance by Genesis;

(c) It is apparent from the technical assessments that the environmental effects of the Tekapo PS are well known and understood;

(d) The present book value of the Tekapo PS is approximately $1.124 billion,[107] and offers a wide range of benefits at a local, regional and national level;

(e) The findings and recommendations of the Climate Change Commission reiterate the importance of New Zealand's existing hydro-electricity generation fleet and reinforce the need to protect the output from existing assets, thus reducing reliance on yet to be identified and implemented alternatives. Reconsenting the Tekapo PS on the same basis as it is presently authorised is consistent with meeting the recommendations of the Climate Change Commission in that it does not involve any reduction in the present level of renewable electricity generation from the scheme. Any reduction in generation output as a result of additional restrictions imposed on the present operating regime through the reconsenting process will be inconsistent with meeting the Climate Change Commission recommendations;

(f) The granting of consents for the Tekapo PS would be consistent with the National Policy Statement for Renewable Electricity Generation 2011 ("**NPSREG**") and commitments to maintaining and increasing the generation of electricity from renewable resources;

[107] The Book Value of the Genesis Tekapo PS asset reported as at 30 June 2024, Genesis Energy Limited FY24 Sustainable Finance Report.

(g) Whilst it is recognised that the national policy framework regarding freshwater has been subject to recent change (and has changed multiple times in the last ten years), the review provisions under the RMA provide adequate safeguards to re-evaluate the conditions of consents (if necessary) in the future;

(h) Genesis is offering conditions of the type envisaged that support the granting of a 35-year term:

(i) Conditions requiring supply of information relating to the exercise of the consents sought;[108]

(ii) Conditions requiring observance of the standards and terms specified in the WAP;[109]

(iii) Conditions requiring preparation of biodiversity and high flow management plans and strategies that are readily amenable to being updated and adapted to apply best practice and take account of changing circumstances;[110]

(iv) Conditions requiring implementing of the extensive mitigation that is proposed;[111] and

(v) Review conditions addressing the following matters:

(1) To review the effectiveness of the conditions of this consent in avoiding or mitigating any adverse effects on water resources or persons from the exercise of this consent and, if necessary, to avoid, remedy or mitigate such effects by way of further or amended conditions;[112] or

(2) To review the consistency of conditions of this consent with future changes to the WAP or CLWRP;[113] or

(3) To review the appropriateness of any take rate and/or take volume specified within this consent if CRC consideration of any relevant information for this application necessitates addressing any

---

[108] For example, water permit conditions 8(b), 10, 11, and 12, Schedule One General Conditions 31, 33, 36, 37 and 39.

[109] For example, water permit conditions 6, 7, 8, discharge permit condition 3, Schedule One General Conditions 1 – 16.

[110] For example, Schedule One General Conditions 2 – 16 and 26 – 37.

[111] For example, Schedule One General Conditions 26 – 37.

[112] For example, water permit condition 9, Schedule One General Conditions 41 – 43.

[113] For example, Schedule One General Conditions 41 – 43.

inappropriateness of any take rate and/or take volume by way of reducing any take rate and/or take volume.[114]

These review conditions allow for any concerns as to the ongoing appropriateness of any condition, including conditions for the take (or discharge) rate or volume, to be addressed during the term of the consent.

(i) A term of less than 35 years would create uncertainty for Genesis (and the households and businesses in New Zealand reliant on electricity) as to the long-term security of New Zealand's electricity supply and enable the efficient use of a significant natural and physical resource. Genesis needs the certainty of a 35-year term to provide the level of security required;

(j) The proposed review conditions are entirely capable of ensuring the other conditions of consent do not become outdated, irrelevant or inadequate;

(k) There is no evidence of expected future change in the vicinity of the takes / diversions, or the wider Mackenzie and Waitaki regions, that would warrant a shorter term. Indeed, there is a high degree of confidence in ongoing electricity demand in New Zealand, which underpins the need for the consents sought;

(l) There is no uncertainty about the effectiveness of the proposed conditions to protect the environment, or any suggestion that Genesis has ever been unresponsive to effects on the environment. The conditions of consent reflect existing conditions, which (combined with the mitigation agreements) have proved to be effective in managing any adverse environmental effects of existing operations;

(m) The proposed activity generates known and minor effects on the environment on a constant basis, rather than generating fluctuating or variable environmental effects, depending on human intervention or management for maintaining satisfactory performance, or relying on standards that have been altered in the past and may be expected to change again in future; and

(n) The Tekapo PS activities carry a low level of risk insofar as they continue the existing water take and discharge regime for the Tekapo PS. There can be no concerns with Genesis's financial position or ability to implement controls intended to avoid, remedy or mitigate significant adverse effects on the environment.

As noted above, review conditions are relevant to the question of consent term. Notably, the review conditions proposed in Appendix D are not limited to being exercised in the event that the proposed activity generates more than minor adverse effects on the

[114] For example, Schedule One General Condition 42(b) and (c).

environment: but instead provide clear pathways to review the consent conditions if there are relevant changes in the planning and allocation regime for the catchment.

In light of all these factors, the proposed 35-year term for the Tekapo PS resource consents is justified and will promote the sustainable management of natural and physical resources of regional and national significance.

4. ENVIRONMENTAL SETTING

4.1 INTRODUCTION

This section of the AEE provides a summary of the existing physical, social, environmental, and cultural values of the Tekapo PS and surrounding area. This description of the existing environment provides the context against which the environmental effects of the Tekapo PS have been assessed.

Several technical assessments have been commissioned by Genesis to inform the description of the existing environment in this section of the AEE. These technical assessments are referenced, as appropriate, in the sections below and are appended to this AEE.

4.2 CULTURAL SETTING

The cultural setting for these applications is described in the Treaty Impact Assessment prepared by Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki for the Tekapo PS (**Appendix A**).

In summary, Kāi Tahu has a long association and involvement with the Waitaki catchment, and it remains of paramount importance to the iwi. The Crown has recognised this significance in the Ngāi Tahu Claims Settlement Act 1998, including through statutory acknowledgements of various waterbodies in the Waitaki catchment, including for Takapō in Schedule 57 and Lake Pūkaki in Schedule 34. The statutory acknowledgements relevant to the Tekapo PS are included in **Appendix I**.

Kāi Tahu identified seven lakes as the headwaters of the Waitaki. Historically the river spread out and meandered over the plains of the Upper Waitaki. Many small creeks came tumbling in adding water as the mainstem Waitaki gained in size and power as it moved downstream.

These lakes formed part of the seasonal cycle of gathering. Rotating gathering across multiple sites (over a takiwā), and following seasonal harvesting patterns, were important sustainability measures. Historically there were more than 160 settlements across the Waitaki. Connecting these settlements were land and water based trails. Whanau at the sites – either permanently or temporarily – were sustained by the abundance of resources found in wetlands, streams and the Waitaki itself.

The Waitaki lies under the cloak of Manawhenua rangatiratanga and is cared for and managed by Manawhenua to the greatest extent possible, in a manner consistent with kaitiakitanga. The connections of Kāi Tahu to the lands and waters of the Waitaki remain and represent the foundation of whanau spiritual, social and emotional wellbeing. More specifically, cultural activities, including mahinga kai, continue to be essential to the

wellbeing of Kāi Tahu for whom a state of well-being, reflects an ability to thrive and prosper – it reflects the interconnections across past, present, and future generations.

Kāi Tahu have one river that unites all 70,000 iwi members – Ko Waitaki te awa. Many generations of Kāi Tahu leaders are buried on lands within the catchment. Today's generation, their children's children and all the children of the generations to follow will mihi to Aoraki and the Waitaki River and will continue to identify with the importance of this particular catchment within the wider Kāi Tahu rōhe.

4.3 GENERAL SETTING

The Tekapo PS is part of the Waitaki Catchment, which drains from Ka Tiritiri O Te Moana / Southern Alps to the Pacific Ocean. It has a total catchment area of approximately 11,800 km^2. The upper reaches of the catchment near the main divide are over 3,000m high and include several major glaciers. The lower reaches of the catchment comprise of hill country, rolling downlands and gently sloping plains.

The upper Waitaki comprises four major tributary basins being Takapō, Pūkaki, Ōhau and the Ahuriri. With the exception of Ahuriri, all these basins contain large glacially formed lakes being Lake Pūkaki, Takapō and Lake Ōhau. Above and below the lakes the rivers generally have braided gravel beds except where the riverbed is occupied by hydro lakes such as Lake Benmore, Lake Aviemore and Lake Waitaki. The lower Waitaki, which extends from the Waitaki Dam to the Pacific Ocean receives flow from the Hakataramea and Maerewhenua rivers along with a number of smaller tributaries.

In terms of the landscape context, the Tekapo PS is located within the Mackenzie Basin Outstanding Natural Landscape. The Mackenzie Basin forms the largest intermontane basin in New Zealand. Biophysical features include extensive glacial terraces, moraines, lakes and kettle holes, as well as broad fluvio-glacial outwash surfaces. The Mackenzie Basin is a homogenous, highly legible landscape which expresses its formative glacial origins in its current geomorphology. The mountain ranges surrounding the Mackenzie Basin include Aoraki / Mount Cook as part of the Southern Alps to the west, the Two Thumb Range to the north and the Ben Ōhau Range to the south. The Basin contains Lakes Ōhau, Pūkaki and Takapō, which accentuate the openness and vastness of this landscape.

Figure 26 presents an overview of the Waitaki River catchment, the Takapō River catchment and the Takapō catchment.

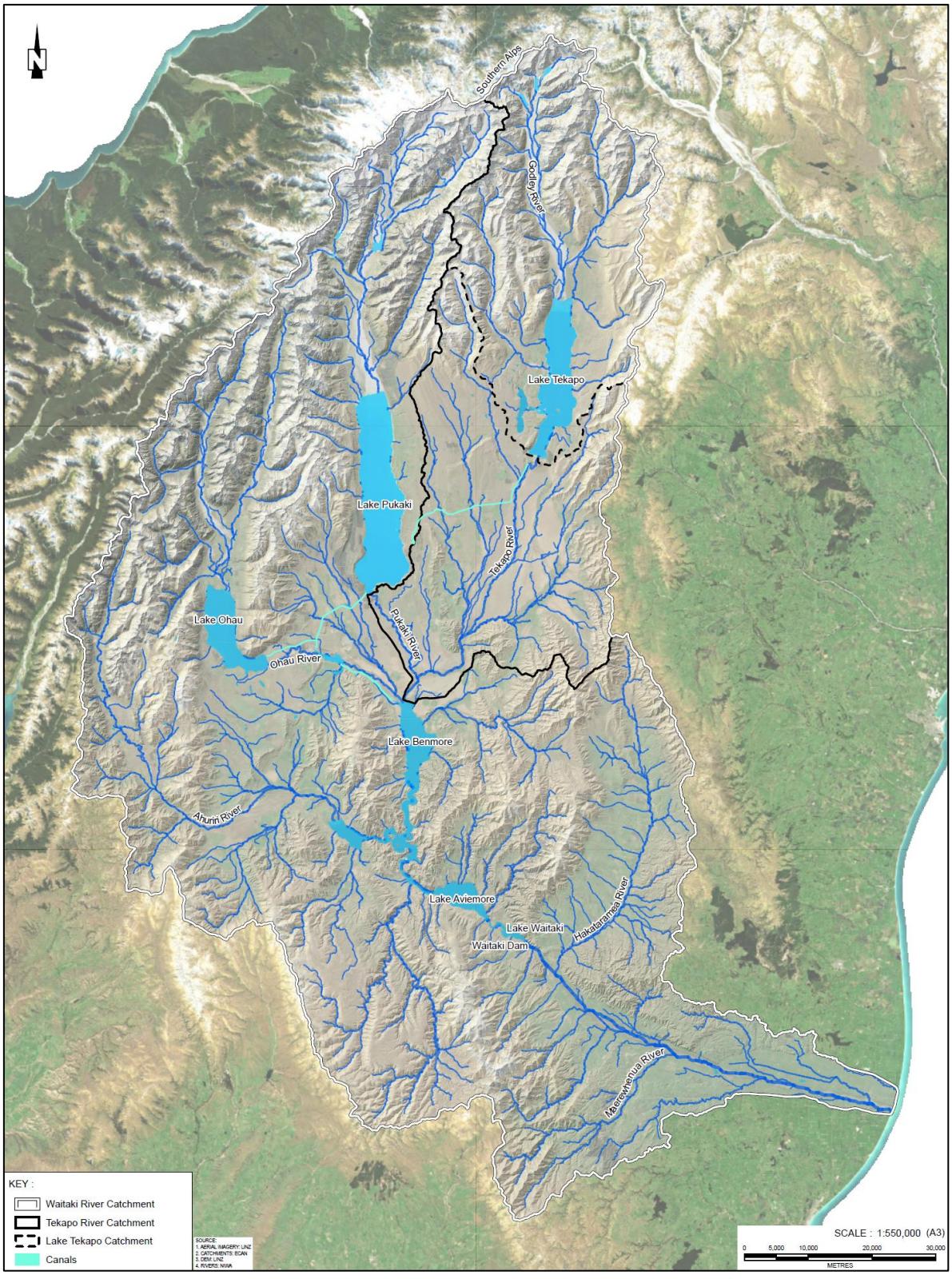

Figure 26: The Waitaki Catchment

4.4 SURROUNDING LANDUSES AND DEMOGRAPHICS

A large part of the upper Waitaki area sits within the Mackenzie District. Mackenzie District is the third smallest territorial authority in New Zealand in terms of population size. However, the area of the district is large compared to its population size, with the district comprising of 745,562 hectares.

Within the Mackenzie Lakes statistical area (which includes the Tekapo township), the 2023 census data indicates that 1,131 people usually reside in the area. Sixty-three (63) people, or 5.6% of the population, identified as Māori. In respect of the Twizel statistical area, there are 1,674 (2023) people residing permanently in the area, 12.5% of whom are Māori.

Since 2013, growth in the Mackenzie District has significantly exceeded growth projections, which has been driven by growth in the tourism industry. This growth in the tourism sector has attracted both visitors and residents alike.

In terms of growth projections into the future, MDC prepared a growth projections report in 2020[115] that sets out:

1. The usually resident population in the Mackenzie District is projected to grow from 4,950 in 2020 to 9,050 in 2050. In the Mackenzie Lakes area (which includes Tekapo) the usually resident population is expected to increase significantly, growing from 1,142 in 2020 to 2,550 in 2050;

2. In terms of Tekapo specifically, the report sets out that in recent years Tekapo has experienced unprecedented growth due to an increase of domestic and international tourism. This has led to an increase in dwellings (both occupied and unoccupied) and significant growth in the usually resident population. Population growth in Tekapo is expected to continue to increase from 504 in 2020 to 1240 in 2050, growing at an annual average rate of 2.3%;

3. As is the case with Tekapo, the population of Twizel is also projected to increase significantly over the next 30 years. Twizel has the largest population in the Mackenzie District at 1,524 usually resident people, and this is projected to grow to 3,395 (at a rate of 2.6% per annum);

4. Tekapo is predicted to reach dwelling capacity in approximately 2030 and Twizel approximately 2040;

[115] Mackenzie District Growth Projections – 2020, prepared for Mackenzie District Council by Rationale Limited, August 2020.

5. The peak day visitor nights are projected to grow from 9,239 in 2020 to 32,568 in 2050. The average day visitor nights will increase from 2,363 in 2020 to 8,330 in 2050; and

6. It is likely that the Mackenzie District will experience an impact in respect of COVID-19 job losses larger than other areas around New Zealand. This is due to the importance of the local tourism industry to the economy, and its dependence on international visitors. However, it is likely to recover by around 2025.

The growth identified in the Rationale report indicates[116] a doubling in outdoor recreation participation by residents and a tripling in participation by visitors over a 30-year period which is likely to result in significantly increased pressure on recreation facilities, the potential for increased recreation conflict, and the need for additional recreation infrastructure, management and regulation. While this may imply a shift in emphasis from management of lakes, rivers and canals for hydro-electric purposes towards recreation and tourism purposes, it must equally be recognised that access to the lakes, rivers and canals is facilitated by the existence of the hydro-electric infrastructure and that the value of low-carbon electricity generation will also be increasing simultaneously. This is especially so in relation to tourism where decarbonisation will be vital in future sustainable tourist trends and marketing, as already seen in Queenstown and Wanaka with a drive to create a carbon zero tourism industry in the district by 2030.[117]

In the Mackenzie District, there are three key industries: agriculture, electricity generation and tourism. The agriculture and electricity generation industries had a gross domestic product ("**GDP**") in the year to March 2019[118] in excess of $60 million each with tourism accommodation almost $35 million, together contributing more than 50% of the district GDP of $293 million. These key industries rely on the ability to utilise freshwater.

4.5 ZONING AND PLANNING FRAMEWORK

The Canterbury Regional Policy Statement ("**CRPS**"), CLWRP and WAP collectively identify the area in which Tekapo PS is located as having the following environmental values and characteristics:

1. Both Takapō and Lake Pūkaki are identified as statutory acknowledgement areas in the CRPS (Appendix 1) in accordance with the Ngāi Tahu Claims Settlement Act

[116] Tekapo Hydro Scheme Reconsenting Recreation Review, 2023. Prepared by Rob Greenaway & Associates.

[117] Queenstown Lakes announces intention to be first carbon zero tourism destination in the world, Wednesday 23 November 2022 (Queenstown, NZ). Joint media release from Destination Queenstown, Lake Wānaka Tourism and Queenstown Lakes District Council.

[118] Regional Economic Activity Interactive Tool, owned by Ministry for Business, Innovation and Employment, accessed November 2022.

1998. The statutory acknowledgements describe the relationship of Te Rūnanga o Ngāi Tahu with these lakes, which includes urupā (resting places of tupuna) and mahinga kai values. The CRPS also notes that mauri is a critical element of the spiritual relationship of Te Rūnanga o Ngāi Tahu with Takapō and Lake Pūkaki;

2. The Mackenzie Basin is listed in the CRPS (Appendix 4) as an outstanding natural feature and landscape at a regional scale. Both Takapō and Lake Pūkaki are specifically identified as having aesthetic and tāngata whenua values which contribute to the outstanding natural feature and landscape values of the Mackenzie Basin. The CRPS acknowledges that the Combined WPS forms part of the Mackenzie Basin landscape;

3. Both Takapō and Lake Pūkaki have a water quality classification of 'Large High-Country Lake' in the CLWRP;

4. The rivers and streams that discharge to lakes Takapō and Pūkaki have a water quality classification of 'Hill-fed Upland;'

5. Lake George Scott is identified as being a 'Small to Medium High-Country Lake' on the CLWRP planning maps;

6. The Takapō River is identified on the CLWRP planning maps as being a 'Lake-fed Upland River.' The various tributaries of the Takapō River are generally identified as being 'Spring-fed Upland Rivers;'

7. The Tekapo PS is located within the upper Waitaki–Haldon Arm Nutrient Allocation Zone in the CLWRP. This zone is identified as being 'At Risk' of not meeting the water quality guidelines;

8. Lake Benmore (where the Takapō River discharges) is identified as being an 'Artificial On-River Lake' on the CLWRP Planning Maps;

9. The Tekapo PS is identified in the CLWRP as being over a semi-confined or unconfined aquifer;

10. Tekapo PS infrastructure is located within three Groundwater Allocation Zones in the CLWRP: Waitaki – Upstream Tekapo, Waitaki – Upstream Dam and Waitaki – Upstream Pūkaki;

11. The Tekapo PS is located within the upper Waitaki Freshwater Management Unit, and in the 'Haldon Zone;' and

12. Some areas surrounding Tekapo PS infrastructure are identified areas of 'High Runoff Risk Phosphorus Zone' in the CLWRP.

In respect of the MDP:

1. The majority of the land on which Tekapo PS infrastructure is located is zoned 'General Rural Zone;'

2. The WPS, inclusive of the Tekapo PS, was included as a 'Scheduled Area' (Schedule A in the Rural Zone Rules section) in the Operative MDP. This included Lake Tekapo Dam, Tekapo A, Tekapo Canal and the Tekapo B Power Station. This has now been replaced by specific provisions and rules within the Proposed MDP which have a similar effect to the previous scheduled area provisions. The site and zone standards of the Rural Zone section and the rules for Network Utilities in the Proposed MDP do not apply to the operation, maintenance, refurbishment, enhancement and upgrading of an existing hydroelectric power station or water control structure and related activities and external modification thereof as these would now be provided for within the Renewable Electricity Generation section of the plan. The Waitaki power scheme, defined as the electricity generation activities in the Waitaki River Catchment including the structures, works, facilities, components, plant and activities undertaken to facilitate and enable the generation of electricity from water is provided for as a permitted activity. It includes power stations, dams, weirs, control structures, penstocks, canals, tunnels, siphons, spillways, intakes, storage of goods, materials and substances, switchyards, fish and elver screens and passes, booms, site investigation works, erosion and flood control, access requirements (including public access), jetties, slipways and landing places, signs, earthworks, monitoring, investigation and communication equipment and transmission network;

3. The land between Takapō and Lakeside Drive is zoned 'Open Space' in the proposed MDP. The purpose of the zone is to protect areas considered by the MDC to be appropriate for passive recreation;

4. The Tekapo PS, Takapō and Lake Pūkaki are within the Te Manahuna / Mackenzie Basin Outstanding Natural Landscape;

5. Takapō is identified in Appendix I of the Operative MDP as a 'Site of Natural Significance' (Site 56). It notes that the drawdown of the lake in winter exposes shoreline bays and deltas which are particularly important for waterfowl breeding (e.g., black stilt / kakī, banded dotterel, grey teal and shoveler) and feeding. Rare scree skink have also been observed around the shoreline of Takapō, along with large numbers of aquatic and terrestrial insects;

6. Lake Pūkaki is also identified as being a 'Site of Natural Significance' (Site 18). It notes that it is a deep glacial moraine dammed lake with numerous wildlife habitats. Drawdown for hydroelectric power generation during winter exposes the Tasman River delta at the north end and lake margins which provide overwintering

areas for black stilt / kakī. It also provides feeding and breeding areas for black stilt / kakī and other waterfowl and waders, as well as habitat for three endemic moth species;

7. The Takapō River is identified as a 'Site of Natural Significance' (Site 45). The plan notes that it is a wide, braided alluvial river bed that provides important habitat and breeding areas for native species;

8. An area adjacent to the Tekapo Canal on the western side (at the north end of the canal) is identified as the Tekapo Flat 'Site of Natural Significance' (Site 33). This area includes short tussock grassland and a *Brachaspis robustus* (Robust grasshopper) site;

9. An area adjacent to the Tekapo Canal on the eastern side (at the north end of the canal) is identified as the Tekapo Scientific Reserve 'Site of Natural Significance' (Site 52a). The MDP identified that this area is a reserve area which is "currently the subject of research into nature conservation of dry tussock grasslands and intermittent wetlands in the eastern South Island high country;"

10. An area adjacent to the Tekapo Canal on the eastern side and the Takapō River is identified as the Tekapo Terrace 'Site of Natural Significance' (Site 52). This area has large numbers of terrestrial insects present and includes representative habitat for endemic grasshopper *Sigaus minutus* and the nationally endangered *Brachaspis robustus*;

11. There is a 'Scenic Viewing Area' identified adjacent to the Tekapo Canal at the Lake Pūkaki end (11A). This site provides views to the Aoraki / Mt Cook area;

12. The area adjacent to Lake Pūkaki is identified as being a 'Lakeside Protection Area' (15);

13. There is a height restriction area and no build area located immediately south of the Tekapo A intake, between Lakeside Drive and SH8;

14. A designation for the Tekapo A Switchyard (ID 4) and a designation for the for the Tekapo B Switchyard (ID 5) for Transpower are identified on the Planning Maps;

15. Appendix U of the MDP contains hydroelectricity inundation hazard area maps which shows the locations adjacent to Tekapo PS infrastructure that are identified as being potential subject to inundation in the event of a dam or canal breach (this Appendix will be replaced by a Planning Map Overlay by Plan Change 28); and

16. Takapō is located in the Aoraki Mackenzie International Dark Sky Reserve, as designated by the International Dark-Sky Association.

4.6 CLIMATE

As detailed in the Pattle Delamore Partners ("**PDP 2025**") Hydrological and Hydrogeological report[119] the climate in the area is strongly influenced by Kā Tiritiri o te Moana/Southern Alps, with the climate of the region having a marked influence on hydrology. The main rivers that feed into Takapō are partially snow and ice–fed and have their highest discharges during the spring/summer snowmelt season. The streams and rivers which are predominantly rain-fed (such as Mary Burn and Irishman Creek) tend to have their highest discharges in winter and spring.

The Mackenzie Basin is a drier region in the 'rain shadow' of the Southern Alps. Summers are warm and dry, with maximum temperatures averaging 21°C. Winters are cold, with an average maximum temperature of 8°C. On winter nights the temperature often falls below 0°C. Annual sunshine hours at Takapō average more than 2,400, making it one of the sunniest places in the country. North-westerly winds prevail and are often hot and dry in summer.

In respect of rainfall, average annual rainfall near the main divide is approximately 8,000 mm reducing to approximately 500 mm around the mid- and lower reaches of the Takapō River main stem. The mean rainfall at the head of the Godley River in the upper catchment is appropriately 5,000 mm – 6,000 mm. This decreases sharply to around 1,000 mm for Macaulay at Mount Gerald and to 500 mm near the Tekapo township.

In terms of floods and low flows climate change is anticipated to result in:[120]

a. An overall increase in flood flows. Flood flows are anticipated to increase in winter and spring with no or limited change in summer and autumn.

b. Low flows are anticipated to increase due to the increase in rain in winter (when flows are typically low) and increased snow melt. The total number of extreme low flow events is anticipated to decrease.

Climate change modelling indicates that the greatest changes in flow characteristics can be expected by the end of the century, beyond the duration of the consents sought.

4.7 TAKAPŌ

4.7.1 Natural Character

A description of the existing environment as it relates to natural character, landscape and visual amenity of waterbodies associated with the Tekapo PS is provided in the Boffa

---

[119] Tekapo Power Scheme – Hydrological and Hydrogeological Analyses, 2025, reference number A02482505. Report prepared by Pattle Delamore Partners Limited, (attached as **Appendix K**).

[120] Tekapo Power Scheme – Hydrological and Hydrogeological Analyses, PDP 2025.

Miskell Natural Character, Landscape and Visual Amenity Effects Assessment ("**Boffa Miskell Landscape, 2023**").[121] This report is attached as **Appendix J** to this AEE and is summarised below.

a. Overall, the natural character of Takapō is considered to be "Moderate;"

b. The natural levels of Takapō have been modified by the Lake Tekapo Control Structure. The controlled water level regime contributes to the episodic nature of erosion. The changing lake levels can restrict the establishment of vegetation within the lake margin that is influenced by lake level fluctuations;

c. When the lake levels are low relatively large unweathered rocky shoreline margins can be exposed;

d. Structures in the lake include the Lake Tekapo intake structure, outlet dam/control gates and SH8 road bridge, pedestrian bridge near the outlet, and a boat ramp. Infrastructure, buildings and roads of Tekapo village also encroach into the margin of the lake; and

e. Takapō is a dominant natural feature of the basin with its turquoise colouring contrasting with the surrounding hills. Experientially the lake appears to retain high levels of naturalness (with the exception of Tekapo Village and the hydro structures at the southern end).

4.7.2 Hydrology

This section and section 4.7.3 rely on the PDP, 2025 hydrology and hydrogeological report,[122] which is attached as **Appendix K** to this AEE and is summarised below.

Prior to the development of the Tekapo PS in 1951, Takapō lake levels were controlled by the natural inflows and outflow from the lake. The pre-1951 lake levels varied between 704.4 and 707.1 masl. Genesis now manages the lake within the consented minimum and maximum levels (as set out in section 2.3 and Table 11).

The main inflows into Takapō are the Godley River, Macaulay River (via the Godley River) and the Cass River. There are no flow recorders on these rivers. However, the daily median inflow into Takapō is estimated by Genesis (based on lake outflows and lake levels) and flow statistics for the period 1926 – 2020 and for the period 1991-2020 are estimated to be 66.8 m^3/s and 67.1 m^3/s respectively.

---

[121] Tekapo Power Scheme Reconsenting: Natural Character, Landscape and Visual Amenity Effects Assessment 2023. Prepared by Boffa Miskell Limited.

[122] Tekapo Power Scheme – Hydrological and Hydrogeological Analyses, 2025.

The following Figure 27 provides an overview of the Takapō mean monthly inflows and outflows:

Figure 27: Takapō Mean Monthly Inflow and Outflow

Analyses of the available lake level data by PDP indicates that the lower part of the range has been entered less often since 1991. Minimum lake levels for the periods 1951-1978 and 1979-1990 are 701.7 masl and 702.1 masl respectively. This compares with a minimum of 702.9 masl for the period 1991-2020, primarily due to the setting of a minimum level in the WAP and conservative operating practices to minimise the risk of levels falling below the statutory level. The lake levels that are exceeded 95 % of the time (lowest 5 percent of the lake levels) are also higher for the period 1991 – 2020 compared to the period 1979 - 1990 and 1951 – 1978.

The influence of managing the water levels for hydropower generation is apparent in the data. The natural lake level fluctuation (pre-1951) is approximately 2.6 m. Post 1951 (1951-1978) lake levels are typically in the range between approximately 702.8 (water level exceeded 95 % of the time) and 710.2 masl (water level exceeded 5% of the time). After 1991, water levels are typically in the range between 704.7 and 710.2 masl. The minimum and maximum water levels are 701.7 and 712.6 masl recorded on 28 August 1976 and 23 December 1984, respectively.

The design flood level of 713.05 masl has never been reached. The maximum recorded lake level since the lake was dammed in 1951 is 712.6 masl recorded during the 1984 flood. Since that time, special flood operating procedures were introduced, and lake

levels have not exceeded 712.0 masl. Figure 28 provides an overview of the Takapō lake levels between 1925 and 2020:

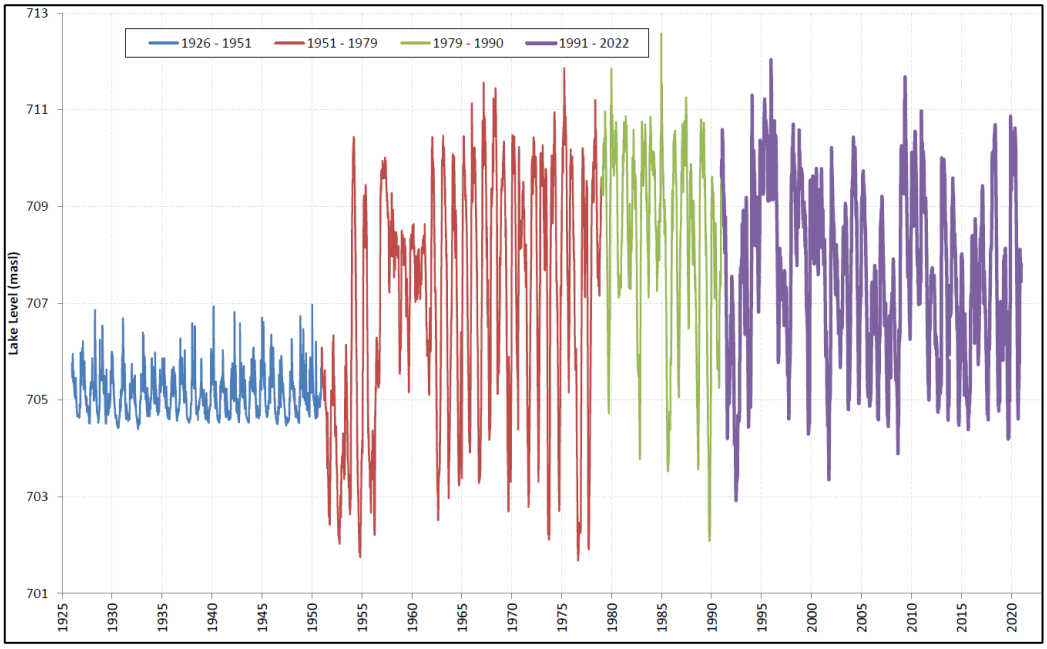

Figure 28: Takapō Lake Levels

In respect of the implication of climate change on Takapō, the available climate change studies[123] indicate an increase in average annual inflow to Takapō for both the mid-century as well as for end century. Flows are likely to increase in winter and autumn due to increased precipitation. The increased precipitation will primarily be as rain in winter with less snow and earlier melt than is currently experienced, while a small decrease in flow in summer is predicted.

Climate change modelling indicates that the greatest changes in flow characteristics can be expected by the end of the century under the 'high emission' scenario. For the low emission scenario there is generally little change in inflow between the baseline period and the mid and end century scenarios.

4.7.3 Hydrogeology

A number of wetlands and other water bodies border Takapō. To understand the effect of water level fluctuations in Takapō on these wetlands/water bodies, PDP, 2023 monitored water levels in seven representative wetlands / waterbodies – Takapō West

[123] For example, *Aotearoa New Zealand climate change projections guidance: Interpreting the latest IPCC WG1 report findings*, Bodeker, G., Cullen, N., Katurji, M., McDonald, A., Morgenstern, O., Noone, D., Renwick, J., Revell, L. and Tait, A. (2022). Prepared for the Ministry for the Environment, Report number CR 501,

3; Lake Alexandrina; Rapuwai Lagoon; Wetland 16135; Lake McGregor; Godley River Wetland 23; and Takapō East 2. These wetland areas are depicted in Figure 29.

The work undertaken by PDP indicates that wetlands/water bodies that are located above approximately 711 masl are unlikely to be affected by lake levels, except during infrequent events when lake levels exceed the maximum operating levels. Wetlands/water bodies located less than 711 masl are expected to have some degree of hydraulic connection with Takapō, although the degree of connection will vary depending on Takapō water levels. This pattern of interconnection will not be altered as a result of the reconsenting as Genesis is not proposing to change the current operating levels for the lake.

There are a small number of domestic supply bores around Takapō that could potentially be affected by lake level fluctuations. However, these bores have all been installed since 2000 (post-scheme) and Genesis is not proposing to change the current operating levels for the lake so effects on those bores will not change from the status quo.

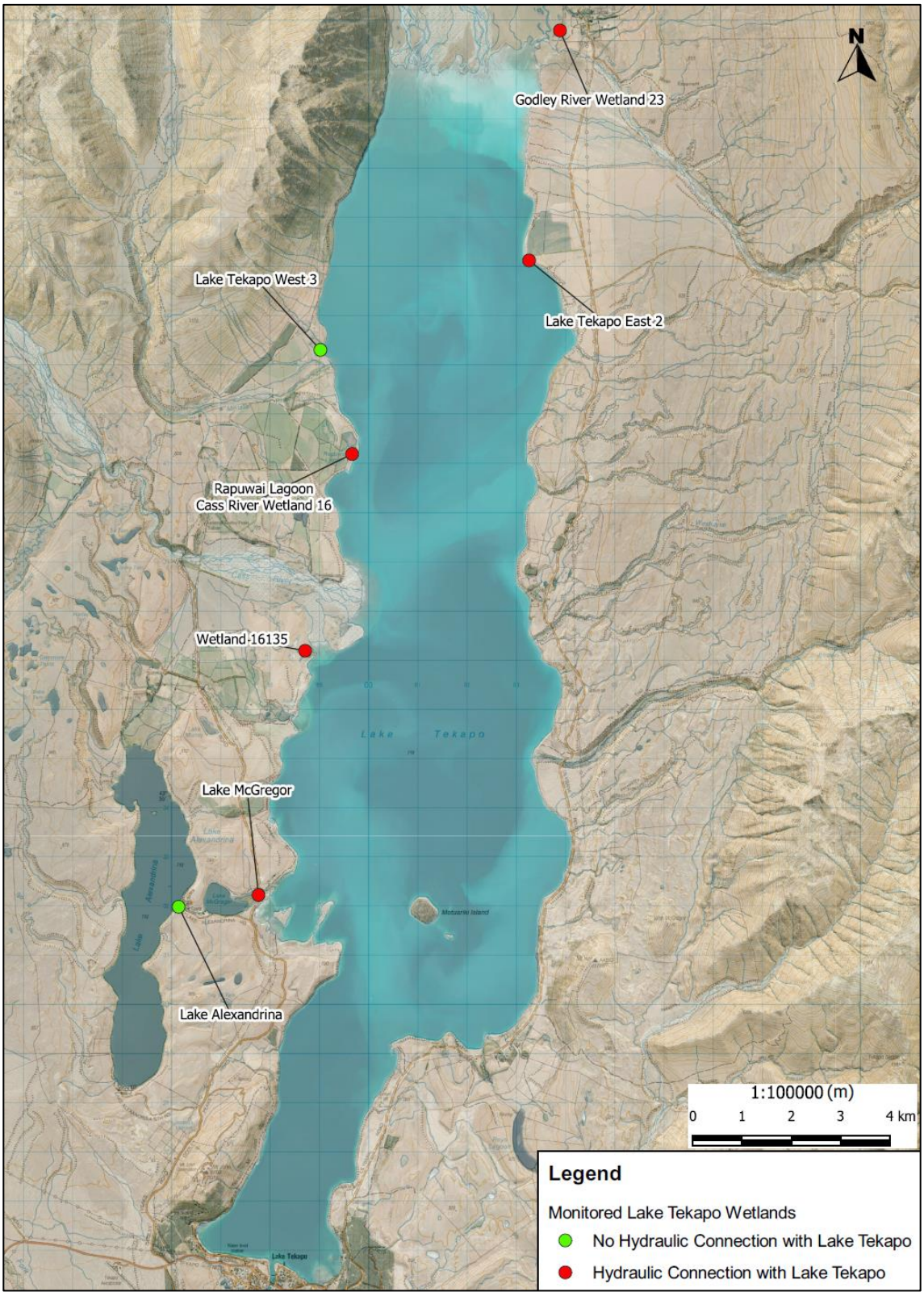

Figure 29: Takapō Wetlands / Waterbodies Monitored by PDP

4.7.4 Water Quality

As detailed in the Cawthron assessment of aquatic environmental effects ("**Cawthron, 2025**"),[124] water quality in Takapō is excellent with low concentrations of nutrients, minimal phytoplankton growth and high dissolved oxygen concentrations, even in the bottom waters of the lake. Water clarity in Takapō has historically been low, due to inputs of glacial flour from the tributaries. Water clarity has increased in recent years, because of reductions of glacial flour within the rivers prior to entering the lake. Clarity is now close to double what it was in the previous decade, likely due to reduced glacial flour resulting from climate change.

Cawthron, 2025 considers that it is unlikely that the construction and operation of the Tekapo PS has resulted in any appreciable changes to water quality within Takapō.

The Cawthron, 2025 report is attached as **Appendix L** to this AEE and is summarised further below.

4.7.5 Ecological Setting

4.7.5.1 Macrophytes

Phytoplankton and aquatic plant (macrophyte) richness and abundance are naturally low in Takapō (Cawthron, 2025). The existing operation of the Tekapo PS is unlikely to have resulted in any appreciable changes to phytoplankton in Takapō.

The distribution of submerged aquatic plants, which is governed by the depth to which sunlight can penetrate, is typically confined to a relatively thin band around the lake edge in lakes with low water clarity. By increasing the range of water levels in Takapō, the existing operation of the Tekapo PS likely reduced aquatic plant distribution and abundance by exposing macrophytes to wave disturbance and desiccation during low lake levels. However, the maximum depth (the euphotic depth) where aquatic plants are found increased from 2012–2017, likely due to the increasing water clarity allowing sunlight (and plants) to reach greater depths. Given the increasing water clarity of the lake, the relative effect of the Tekapo PS on macrophytes has reduced and will reduce further if water clarity continues to increase.

4.7.5.2 Macroinvertebrates

Dense populations of macroinvertebrates in lakes are often associated with aquatic plant beds (macrophytes). Macroinvertebrate richness and abundance is relatively low in Takapō (Cawthron, 2025), reflecting the limited aquatic plant growth in the lake (due to the historically naturally low water clarity caused by glacial flour). As for aquatic plants,

[124] Tekapo Power Scheme reconsenting: assessment of aquatic environmental effects, 2025. Prepared by Cawthron Institute. Cawthron Report No. 3688A.

the Tekapo PS likely reduced macroinvertebrate abundance and diversity due to it increasing the range of water level variation in Takapō. However, given the increasing water clarity of the lake, the relative effect of the Tekapo PS on macroinvertebrate abundance and diversity compared with twenty years earlier has reduced and will reduce further if water clarity continues to increase (as it is assumed to do due to climate change).

4.7.5.3 Native Fish

Water Ways Consulting undertook surveys[125] in Lakes Alexandria, McGregor and Takapō, Rapuwai Lagoon and Patterson Ponds, the results of which are summarised as follows:

a. The surveys found six native fish in the Takapō River, Canterbury galaxias, alpine galaxias, kōaro, common bully, upland bully and longfin eel;

b. Canterbury galaxias and upland bully were widespread and generally common, while common bully were more restricted occurring close to Lake Benmore but were more abundant in all lakes surveyed in the catchment;

c. Adult kōaro were common in Lakes Alexandrina and McGregor but rarely caught in Takapō;

d. Alpine galaxiids are common in the upper reaches of tributaries upstream of Takapō, such as Edwards Stream, but were rare with only five individuals found at two sites in the mid-reaches of the Takapō River; and

e. Large longfin eels were found in a Grays River tributary and in Patterson Ponds, and a single longfin eel was found immediately downstream of the Fork Stream culvert at the upper reaches of the Tekapo River.

The Water Ways Consulting report ("**Water Ways, 2025**") is attached as **Appendix M** to this AEE.

4.7.5.4 Salmonoid Values

Salmonids such as brown trout, rainbow trout and Chinook salmon are present in Takapō. However, due to the relatively low productivity of the lake, the fishery is naturally restricted. Nevertheless, it is more popular with anglers than Lake Pūkaki (which is highly turbid), but much less popular than Lakes Benmore and Aviemore. Angler use of Takapō has increased since 1994/95, possibly due to increased salmonid abundance in response to the increasing productivity around the shallow margins of the lake as water clarity has improved. While lake level fluctuations associated with the Tekapo PS have affected macrophyte and macroinvertebrate abundance and diversity in the shallow margins of

[125] Tekapo Power Scheme: Native Fish Assessment of Ecological Effects, Report 61-2018, 2025. Prepared by Water Ways Consulting Ltd.

the lake, a trend of increasing water clarity (and associated increase in euphotic depth) is likely to improve productivity in Takapō and hence improve the conditions for salmonids and the lake's angling values.

4.7.6 Shoreline Morphology

A description of the existing shoreline morphology of Takapō is provided in the Shore Processes and Management Limited lakeshore geomorphology report ("**Shore Processes, 2022**").[126] This report is attached as **Appendix N** to this AEE and is summarised below.

Takapō occupies a glaciated valley, partially blocked by moraine and outwash deposits. The catchment for the lake is approximately 1,440 km^2, and includes glacial valleys, with the main tributaries being the combined Godley, Macauley and Coal Rivers at the northern end of the lake, and the Cass River on the western flank. Three smaller named tributaries feed into the lake. The lake is long compared to the width, with the long axis running approximately north south.

The southern shore of Takapō is formed into moraine deposits, with terminal moraine along the southern shore fronting Tekapo township, and lateral and glacial edge moraine along the base of Mt John. The eastern and western shores are formed into more recent fluvial deposits and fans resulting from erosion of the surrounding hills. Fluvial deposits from the Godley, Macaulay and Coal Rivers dominate the northern shore. The river mouths combine to form a large deltaic landscape, while the shoreline builds southwards due to the abundant supply of sediment from upstream.

An overview of the geomorphology of Takapō is provided in Figure 30 (northern section) and Figure 31 (southern section).

The overall character of the shore indicates a developing geomorphology. Most of the shore has beaches with sediments that are able to be moved by waves, and are dynamic, adjusting in response to changes in the process environment. There are sites that exhibit active erosional processes, and although these are ongoing, they occur intermittently and are related to periods of high-water levels with strong winds generating erosive waves. Similarly, there are evolving accreting landforms such as barrier beaches and infilling pocket beaches.

Shoreline development on Takapō is related to the natural processes of wind-generated waves causing sediment movement across the beach and along the shore. Waves and nearshore currents work on the shore and backshore sediments. The energy of the waves controls the potential amount of work that can be done. The lake level controls

[126] Tekapo Power Scheme re-consenting: Lakeshore geomorphology and processes Existing environment and future effects, 2022. Prepared by Shore Processes and Management Ltd.

where, with regard to the elevation on the shore profile, that work is done. In respect of waves, the wave processes are topographically channelled along the north – south axis of the lake, with stronger winds generating larger waves from the north than from the south. Wave events from the north are generally of longer duration than those generated from the south. The result is a wave environment that presents waves breaking at a strong angle to the western and eastern shores but breaking nearly parallel to the southern and northern shores.

In respect of lake level, the lake water level and the range of levels within the operating regime on Takapō determine the elevation range where the wave activity acts on the shore profile. Higher lake levels will place the zone of wave activity higher on the profile, and if coincident with high energy waves can cause erosion of the upper part of the beach with deposition of sediment at the limit of wave run-up and lower down the profile in the nearshore. At low levels wave action works on the lower part of the shore profile, removing the upper part of the profile from the zone of wave action, while the nearshore shelf and face are actively worked.

Extension of the lake level range since 1954 has resulted in erosion of the hinterland backshore composed of hillslope, moraine and fluvial deposits. Retreat of the steeper hinterland backshore resulted in near vertical cliffs in some locations. Wave action eroding the base of these slopes during periods of high lake levels has resulted in episodic erosion of the cliff and retreat of the shoreline. Subaerial weathering has also slowly resulted in the retreat of the top of the slope. In addition, the relatively stable water levels (i.e., the few occurrences of low lake levels, and few occurrences of high lake levels) has resulted in stable areas of backshore, where the beach protects the base of steep slopes. However, there are isolated sections of cliffed shore where the base of the cliff is at or below 710 masl, and there is only a narrow beach to dissipate wave energy. These cliffs are actively retreating. Subaerial weathering is an additional cause of erosion of steep cliffs and is part of the ongoing process of shore development.

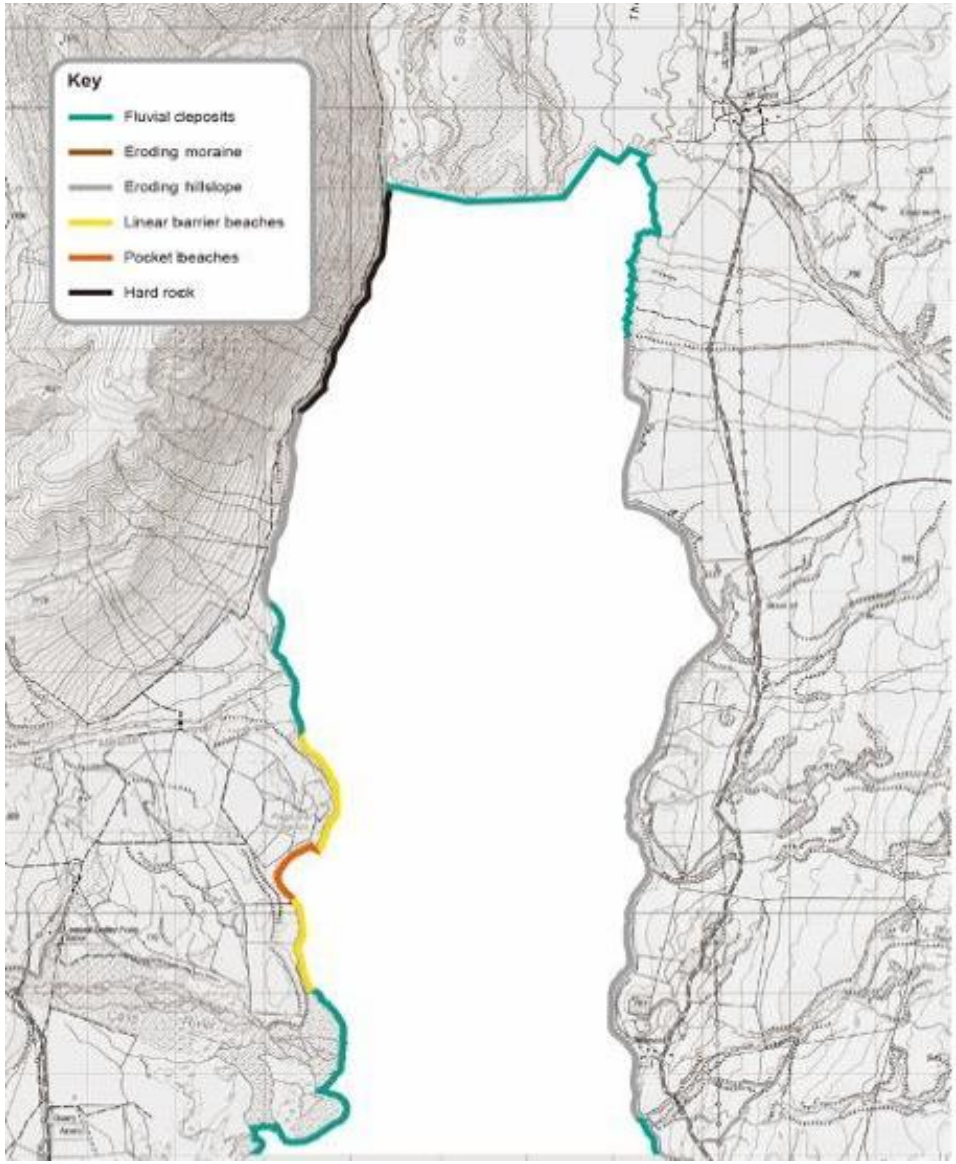

Figure 30: Takapō Geomorphology (Northern Section)

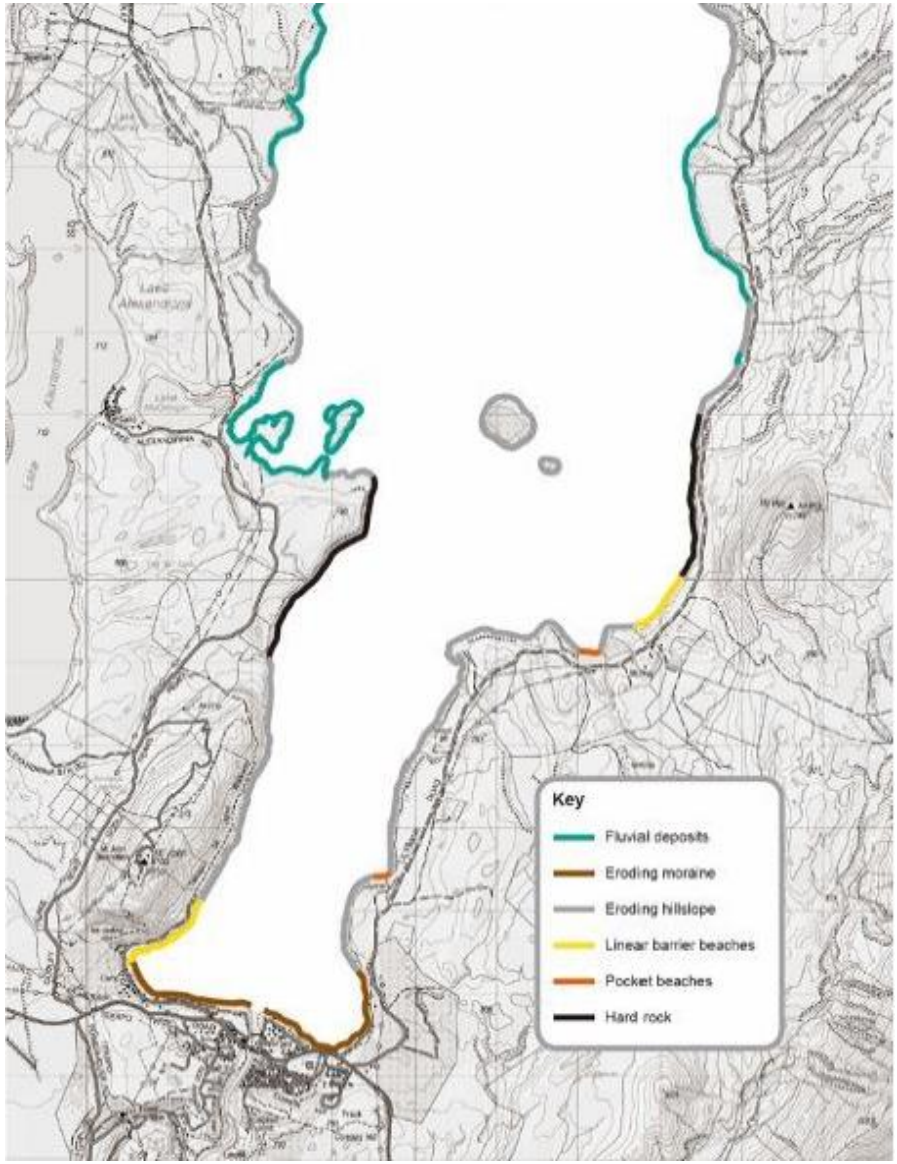

Figure 31: Takapō Geomorphology (Southern Section)

4.8 TEKAPO CANAL

4.8.1 Natural Character

Overall, the natural character of the Tekapo Canal is assessed as being "Very Low" by Boffa Miskell Landscape, 2023. Whilst a distinctive and recognisable element in the Tekapo landscape that provides a high level of amenity that is associated with fishing and angling, the 25.5km structures are entirely man-made for the purposes of the conveyance of water associated with the operation of the Tekapo PS.

4.8.2 Hydrology

As detailed by PDP, 2025, flows at the Tekapo A and Tekapo B power stations vary depending on several factors including electricity demand, lake levels and Takapō inflows.

Median and mean Tekapo Canal flows are approximately 90 m^3/s and 76 m^3/s respectively for Tekapo B and 84 m^3/s and 69 m^3/s for Tekapo A. The difference is made up by flows sometimes bypassing Tekapo A via occasional releases at the Tekapo Control Structure (Gate 16) into the upper Takapō River and being discharged back into the Tekapo Canal at Gate 17.

Mean monthly flows in the canal are typically higher in winter, especially July and August (82 m^3/s for Tekapo A and 83 – 84 m^3/s for Tekapo B), when electricity demand is high and lower in September and October (56 m^3/s and 57 m^3/s respectively for Tekapo A and 65 m^3/s and 59 m^3/s for Tekapo B) when electricity demand drops off and the level of Takapō increases following "drawdown" in winter. When the lake level is high in summer, higher canal flows reduce the likelihood of spill.

There was no or very little flow over the Lake Takapō Spillway or through Gate 17 to the Tekapo Canal for approximately 72% of the time over the 1991 to 2022 period, while there was no or very little flow over the Lake George Scott Weir for approximately 90% of the time. This demonstrates that when flows are spilled from the Lake Takapō Spillway (Gate 16) the water is typically diverted back into the Tekapo Canal through Gate 17. Most of the time when water is spilled from the Lake Takapō spillway there is no discharge to the Takapō River via the Lake George Scott Weir.

An overview of the mean monthly flows in the Tekapo Canal, at both Tekapo A and Tekapo B is provided in Figure 32.

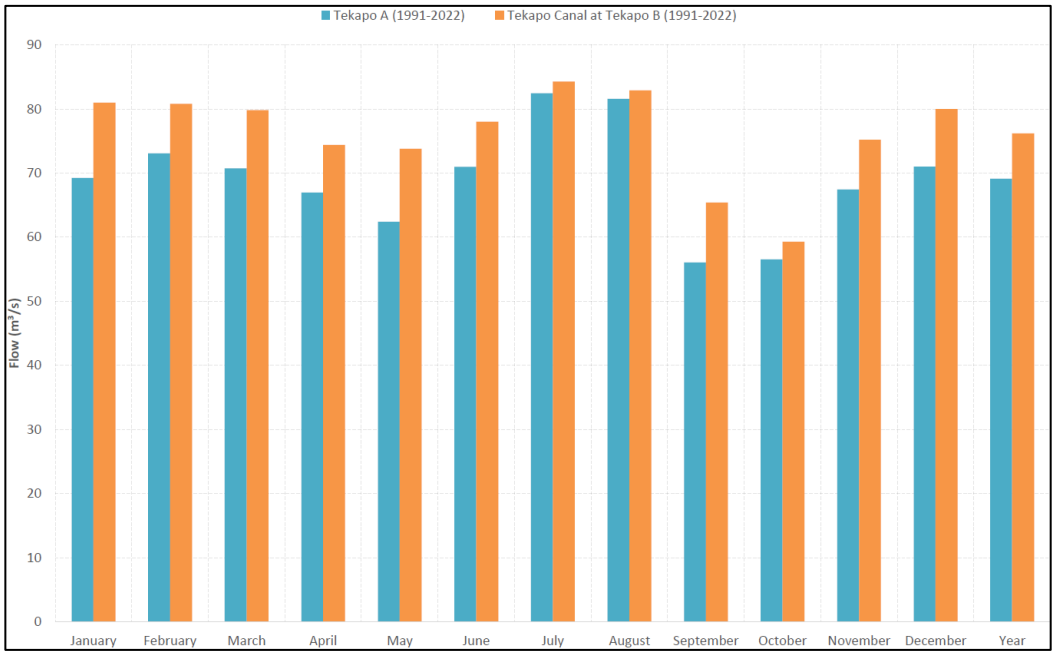

Figure 32: Tekapo Canal Mean Monthly Flows

4.8.3 Water Quality

The water quality in the canal is excellent, reflecting that of Takapō, including being relatively turbid (for a flowing waterbody) owing to naturally occurring glacial flour. Salmon farming occurs in the lower reaches. The operation of the Tekapo PS has not resulted in adverse effect on the water quality within the Tekapo Canal.

4.8.4 Ecological Values

4.8.4.1 Macrophytes

The canal has developed the characteristics of a highly stable, deep river ecosystem. The aquatic vegetation cover in the canal consists of a community of macrophyte beds including both native and introduced species.

4.8.4.2 Macroinvertebrates

The macrophyte beds within the Tekapo Canal support an abundant community of macroinvertebrates with densities observed in the top 15% of rivers throughout New Zealand where comparable data are available.

4.8.4.3 Native Fish

Native fish including common bully, upland bully and longfin eel are present in the Tekapo Canal as discussed in the Water Ways 2025 report. Juvenile kōaro have been observed anecdotally in the Tekapo Canal.

4.8.4.4 Salmonoid Values

The canal supports a nationally significant (and world class) fishery for brown and rainbow trout and Chinook salmon supported by natural recruitment, some stocking, and escapees from the salmon farm. Salmonids in the canal attain sizes and abundances that are significant relative to natural rivers in New Zealand. The canal system is now one of the most popular fisheries in New Zealand; angler usage has tripled since 1994; more than compensating for declines in angler participation that have occurred in the Takapō River after the invasion of didymo.

It was originally considered that the exceptional canal fishery resulted directly from food waste leaving the salmon farms, yet the high macroinvertebrate and bully abundances observed in the canal suggests this is not necessarily the case. To address this, the contributions of farm-derived feed and wild prey to the diet of wild caught trout were quantified using stable isotope analyses by Cawthron 2025. The results suggest that the farm-derived food typically comprised between 16–22% of wild fish diet, although larger fish did have a higher farm-derived diet contribution.

4.9 TAKAPŌ RIVER

Prior to construction of the Tekapo PS, the Takapō River was the outlet for Takapō. As a result of diversion first for Tekapo A (in 1951) and then later into the Tekapo Canal (in 1977), there is usually little or no surface flow in the upper reaches of the Takapō River between the Lake Tekapo Control Structure and its confluence with Fork Stream (approximately 6.6 km downstream).

The flow duration curves for the Takapō Spillway, Gate 17 and the Lake George Scott Weir are shown in Figure 33.

The diversion of water from Takapō for the Tekapo PS through the Tekapo Canal resulted in significant changes to the Takapō River, including:

a. Changing the character and landscape values of the Takapō River;

b. Altering the hydrology of the river, including substantially reducing flow in the Takapō River, particularly above the Fork Stream confluence;

c. Increased the water clarity, which is associated with the diversion (via the Tekapo Canal) of glacial flour from Takapō;

d. Providing a stable flow conducive to greater annual production of periphyton and macroinvertebrates; and

e. Physical habitat (depths, velocities and substrate) downstream of the Grays River confluence that are highly suitable for trout food production and trout spawning.

These matters are discussed in the following sub-sections.

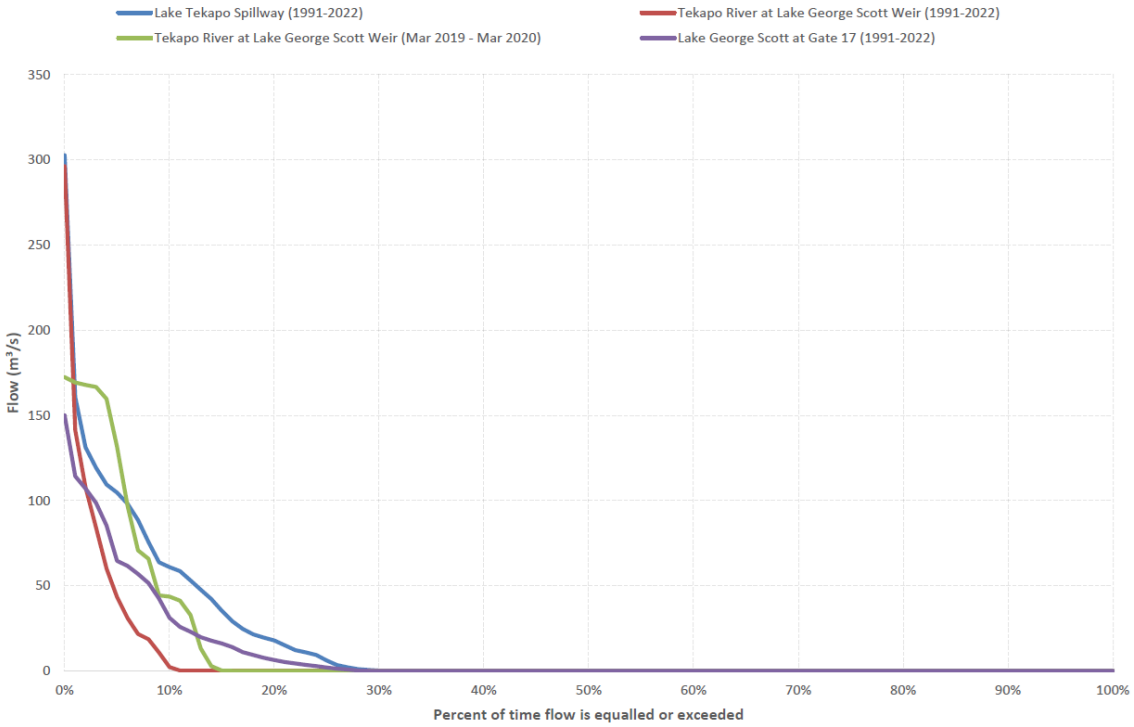

Figure 33: Flow Duration Curves - Lake Tekapo Spillway, Gate 17 and Lake George Scott Weir

4.9.1 Natural Character

Boffa Miskell Landscape, 2023 details that the natural character of the Takapō River between its source (Takapō) and Fork Stream is "Low", due principally to its predominantly dewatered state and "Moderate" for the remaining 39km to its mouth at Lake Benmore. The assessment then describes the character of the river, as follows:

a. The upper reach of the Takapō River between the Tekapo control gates (Gate 16) and Lake George Scott is generally dry as almost all the water from Takapō is diverted through the Tekapo Canal. This modified flow regime diminishes the extent and quality of freshwater habitat and water quality. Morphologically without the natural flows and seasonal floods the natural dynamics of the whole river system and movement of sediments is restricted;

b. For the first 4 km of the Takapō River, flow can vary from as little as 0 m^3/s to many hundreds of cubic metres during periods of flood. Some minor groundwater inflow is recorded between Lake George Scott and Fork Stream (4-7km). During periods of high flows, the water flows through the river without ponding or creating islands. During periods of low flow, the wetted rocky surface area changes significantly and the difference in flow is more detectable on the banks. These changes in managed flow are considered to reduce the natural character of this part of the reach of the Takapō River; and

c. Below the confluence of Fork Stream, the median flow in the Takapō River increases from approximately 3 m^3/s at the confluence with Fork Stream to approximately 10 m^3/s at the CRC flow recorder site downstream of the Mary Burn. As a result, levels of natural character increase beyond Fork Stream, to a moderate degree, noting that the flow regime of the lower Takapō River is still restricted.

4.9.2 Hydrology

4.9.2.1 Upper Takapō River

The CRC operates a flow recorder on the Takapō River just downstream of the Lake Tekapo Spillway (installed in 1968). This recorder has data available for two periods being 1968 until 1978 and 1993 until 2020. In addition, Genesis records flow at the Tekapo Control Gate (Gate 16). Flow data from this site is available from 1957 through to 2020. Release flows from Lake George Scott to the Takapō River are also monitored by Genesis.

As detailed earlier in this AEE, the upper reaches of the Takapō River generally have no or very little flow. Water is typically only discharged from Takapō (via Gate 16) to manage high lake levels, to top up Lake George Scot or if Tekapo A needs to be bypassed or to provide recreational flows. A review of the available flow data for the Lake Tekapo Spillway by PDP 2023 indicates that there is no or very little flow for approximately 72% of the time for the period 1991 to 2020. Lake George Scott Weir has no flow over the weir to the Takapō River for approximately 90% of the time. Some minor groundwater inflow is recorded between Lake George Scott and Fork Stream.

4.9.2.2 Mid Takapō River

The Takapō River has a permanent flow downstream of the confluence with Fork Stream. The data indicates that the median flow in the Takapō River increases from approximately 3 m^3/s at the confluence with Fork Stream to approximately 10 m^3/s at the CRC recorder site downstream of the Mary Burn. This is predominantly due to flow contributions from tributaries such as the Grays River, Mary Burn and Irishman Creek (via the Mary Burn).

4.9.2.3 Lower Takapō River

As detailed in PDP 2025, the lower 4 kilometres of the Takapō River is influenced by flow from the Pūkaki River. Like the upper reaches of the Takapō River, the Pūkaki River generally has no or only a very limited amount of flow due to the Pūkaki Spillway only releasing water when required to lower Lake Pūkaki water levels during and following a flood. Meridian also releases water for recreational (kayaking) purposes. This typically occurs two weekends of the year resulting in a flow of approximately 45 m^3/s for approximately 10 hours per day.

The following table provides an overview of the median monthly flows in the lower Takapō River:

Table 14: Lower Takapō River Median Monthly Flows

Month	Fork Stream at Balmoral (m^3/s)	Takapō River at Downstream Mary Burn (m^3/s)
January	3.4	8.8
February	2.4	9.0
March	2.1	7.0
April	2.0	6.8
May	2.3	8.7
June	2.1	10.0
July	1.7	11.1
August	1.7	11.6
September	1.9	9.9
October	3.3	10.1
November	4.7	13.0
December	4.8	9.7

4.9.2.4 Groundwater – Surface Water Interaction

As detailed by PDP 2025, the Takapō River typically has relatively stable flows in the upper reaches with some flow being lost to groundwater above the Grays River confluence. A significant flow increase typically occurs due to the Mary Burn and Grays River inflows, although there is an additional gain in flow that can be attributed to groundwater inflows immediately downstream of the Mary Burn and Grays River confluences. In the lower reaches as the river enters the Twizel Basin but upstream of the Pūkaki River confluence, an overall loss of river water to groundwater typically occurs.

4.9.2.5 Fresh and Flood Flows

In respect of freshes and flood flows, the PDP 2025 description of the existing environment summarises that:

a. The Takapō River between the confluence with Fork Stream to the confluence with the Grays River receives reasonably regular fresh and flood flows of 3 times the median flow (on average around 4 times per annum). Flows of 6 times the median or greater occur infrequently (on average less than 2 times per annum);

b. The Takapō River between the Mary Burn confluence and Pūkaki River confluence receives infrequent fresh and flood flows of all magnitudes (3, 6 and 10 times the median). The average frequency of these fresh and flood flow events is less than 3 times per annum;

c. The Takapō River downstream of the confluence with the Pūkaki River has a much greater fresh and flood flow frequency than the two upstream reaches (especially for flows 3 times the median) due to the Lake Pūkaki release flows. The average frequency of fresh and flood flow events is around 6, 4 and 3 per annum for flows with a magnitude of 3, 6 and 10 times the median respectively;

d. Mean and maximum accrual times are long, particularly for the larger flood events with a magnitude of 6 times the median or greater. Accrual times of all magnitudes (3, 6 and 10 times the median) are long for the Takapō River at Mary Burn; and

e. The flow data indicates that the frequency of fresh and flood flows in the cooler months (May – September) is relatively low compared to the warmer months (November – April), such that the accrual time is relatively long in winter compared to the warmer summer months.

4.9.3 Hydrogeology

The Takapō River is bordered by a number of bores, wetlands and other water bodies throughout the Takapō River Basin. PDP 2025 undertook monitoring of water levels within a number of these bores, wetlands and other water bodies throughout the Takapō River Basin for the purpose of understanding groundwater and surface water interaction and how these interactions change with flows/stage height in the Takapō River. An overview of the monitoring sites is provided in Figure 34.

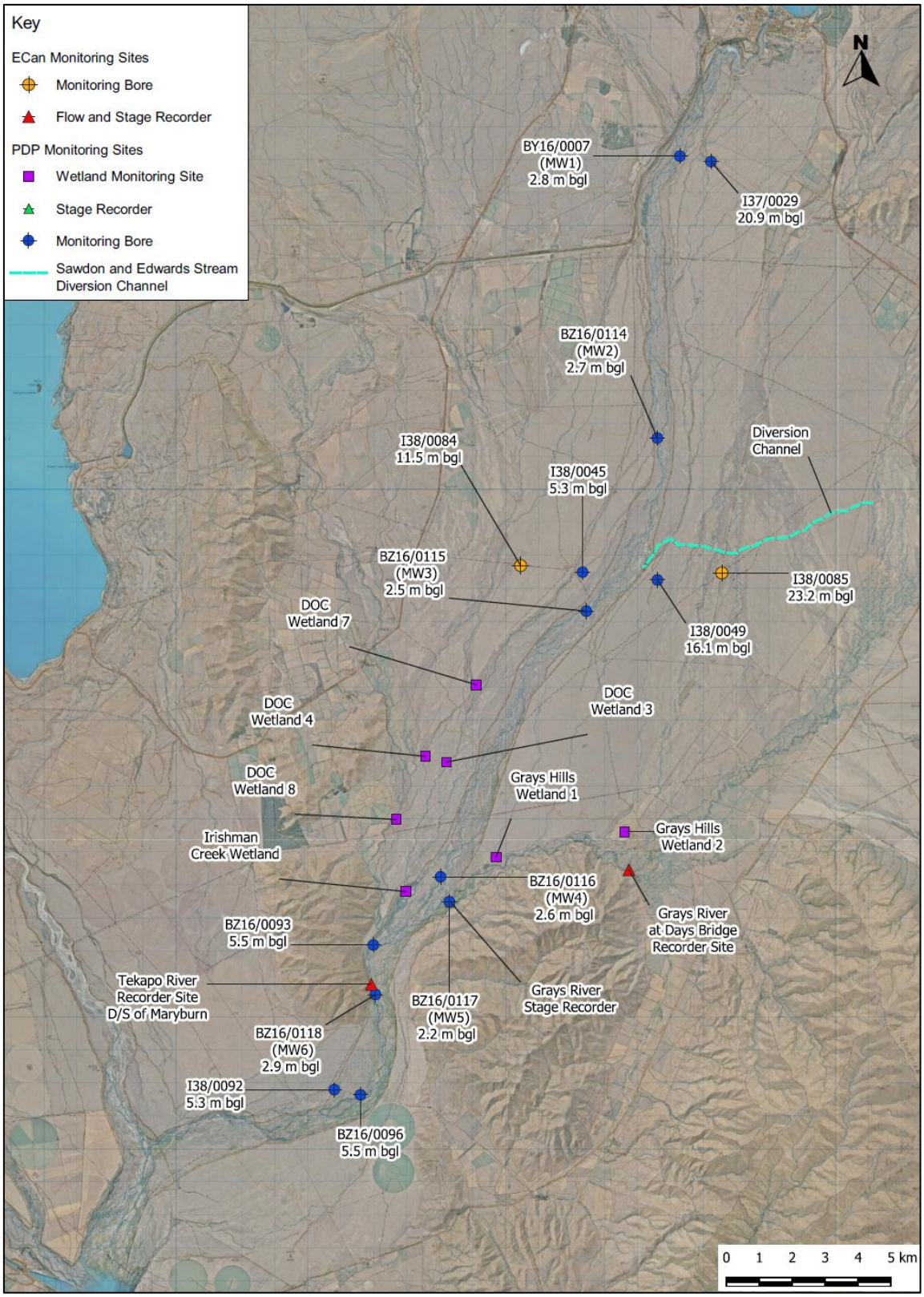

Figure 34: Takapō River Basin Water Level Monitoring Sites

Water levels were monitored within two wetlands east of the Takapō River and in five wetlands located west of the Takapō River (the locations of which are shown on the figure above). The data collected indicates that there is generally no clear hydraulic connection to most wetlands located more than approximately 1 km from the river. For wetlands closer to the river, there may be some influence from the Takapō River flow and stage height. This is because permanent flow in the river is expected to be interacting with/contributing to groundwater surrounding the river and therefore wetland levels close to the river will respond more clearly to changes in river flows and levels. The area where wetlands appear to be affected by Takapō River flow variations is generally where the alluvial strata is younger/more permeable and compared to the older/less permeable strata further away from the river.

4.9.4 Water Quality

The CRC monitors water quality in the Takapō River at a site just upstream of the confluence with the Pūkaki River (at the Steel Bridge). Overall, water quality is high at this site: the median suspended sediment concentration is less than 2 mg/l and the average turbidity of the water (1.2 NTU) is about a third of that in Takapō (3.9 NTU). However, the recent intensification of land use in the Mary Burn, Irishman Creek and Grays River catchments (unrelated to the Tekapo PS) is leading to a trend of higher nitrate and phosphate levels in the Takapō River downstream of the confluences with these tributaries. Water quality is still considered to be high in the lower Takapō River, despite increases in dissolved nutrients since 2000.

The existing operation of the Tekapo PS has resulted in the water quality of the Takapō River largely reflecting that of tributaries rather than the glacial water from Takapō. Water quality is good in the Takapō River and largely meets the targets of the National Policy Statement for Freshwater Management ("**NPSFM**") and the CLWRP. The only exception to this is where the night-time dissolved oxygen drops to around 80% saturation, which is likely due to a high biomass of didymo (Cawthron, 2025) compared with the CLWRP target of 90%. Relatively high daily fluctuations in dissolved oxygen concentration (with associated relatively low daily minima) are caused by the relatively high biomass and cover of periphyton, which often exceed guidelines for the protection of trout habitat and general recreational aesthetic guidelines.

4.9.5 Ecological Setting

4.9.5.1 Macrophytes

As detailed in Cawthron 2025, despite the Takapō River having low nutrient concentrations, periphyton cover assessments by the CRC undertaken between 2006 and 2014 show that periphyton cover regularly exceeds the Ministry for the Environment guidelines for the protection of recreational and aesthetic values.

The periphyton mats in the river include native algae and cyanobacteria, and didymo, which proliferates particularly in the upper and lower sections of the river. Didymo arrived in the catchment in 2007 and rapidly established itself.

Didymo commonly reaches nuisance levels in natural lake-fed rivers due to the stable flow regimes, immobile substrate, and low sediment supply allowing it to accrue with little bed disturbance. The results of Cawthron's longitudinal survey and the monthly sampling suggest that existing periphyton biomass occurs at 'nuisance' levels throughout the year. The long periods of steady flow that are experienced in the Takapō River contribute to the accumulation of high biomass of periphyton. The ongoing operation of the Tekapo PS results in a stable flow regime in the Takapō River, providing good conditions for periphyton (including didymo) proliferation.

4.9.5.2 Macroinvertebrates

The macroinvertebrate communities in the Takapō River have moderate ecosystem health scores (MCI – macroinvertebrate community index) indicative of a moderately nutrient/organically enriched river with abundant periphyton on the riverbed, reflecting the stable flow regime and presence of didymo. Despite some indications of negative effects from catchment land use intensification and proliferations of didymo based on ecosystem health metrics, the macroinvertebrate communities in the Takapō River provide an abundant food resource for fish and birds. The macroinvertebrate communities achieve moderate to high densities and biomass, with a typical mix of both large and small invertebrates. The effects of the existing operation of the Tekapo PS on macroinvertebrates in the Takapō River prior to the arrival of didymo were likely positive, with reduced fine sediment and increased water clarity (due to diversion of glacial lake water to the canal) and a stable flow regime. However, these conditions also provide good habitat for didymo, which has likely increased the proportion of pollution-tolerant macroinvertebrates, many of which are small and less preferred as food for fish and birds.

4.9.5.3 Native Fish

A description of the existing environment as it relates to native fish is provided in the Water Ways 2025 report. This report is attached as **Appendix M** to this AEE and is summarised below.

a. Native freshwater fish surveys were undertaken by Water Ways Consulting in the Tekapo catchment during the summers of 2018-19 and 2019-20. In the first summer these surveys concentrated on fishing sites in the Takapō River between Lakes Takapō and Benmore. In the second summer the surveys targeted longfin eel;

b. The surveys found six native fish in the Takapō River, Canterbury galaxias, alpine galaxias, kōaro, common bully, upland bully and longfin eel. Canterbury galaxias

and upland bully were widespread and generally common. Common bully was more restricted occurring close to Lake Benmore and in the various lakes of the catchment. Kōaro was widespread but occurred sporadically. Alpine galaxias was rare with only five individuals found at two sites in the mid-reaches of the Takapō River. A single longfin eel was found immediately downstream of the Fork Stream culvert at the upper reaches of the Takapō River;

c. Two species, common bully and kōaro, are benefiting from the hydro-electric power scheme developments in the Waitaki catchment. The creation of the new lakes such as Lake Benmore has created new larval fish rearing habitat for these species assisting them to expand their distribution. Kōaro, and possibly common bully have, most likely, also benefited from the reduction in longfin eel abundance as both species are prey of large longfin eels;

d. The longfin eel surveys of the second summer found large longfin eels but no smaller eels and elvers. These large eels were only found in a Grays River tributary and in Patterson Ponds;

e. The threatened native fish species in the Tekapo catchment are the upland longjaw galaxias 'Waitaki,' the lowland longjaw galaxias 'Waitaki' and bignose galaxias which are all reported from the Tekapo catchment but are found in the upper reaches of tributaries of the Takapō River and Takapō. These include Fork Stream, where conservation programmes partially funded by Project River Recovery are creating predator free streams by removing salmonids and placing fish passage barriers in the streams to prevent reinvasion. The restriction of these fish to small headwater streams with long reaches of unoccupied stream between the populations and the Takapō River indicate that the downstream limits for these species are set by factors, such as salmonids, rather than the flow alteration in the Takapō River. The fish survey work also failed to locate habitat for these species along the Takapō River channel. Therefore, it is concluded that the flow changes produced by the Tekapo PS have not affected the fish or the availability of their habitat, rather other factors limit the distribution of these three threatened galaxiids;

f. The majority of native fish populations in the Takapō River appear healthy. Upland bully is common and found along the length of the river and the river provides good habitat for this species; and

g. The Canterbury galaxias is widespread along the Takapō River and is abundant in riffle habitat. This species is affected by the presence of didymo, salmonids and kōaro and given these negative biotic factors the limiting factor for Canterbury galaxias is not expected to the river flow created by the Tekapo PS. Longfin eel abundance is limited, not by the Takapō River flow reduction reducing available habitat rather the lack of recruitment.

Overall, Water Ways Consulting considers that the Takapō River supports the expected range of native fish.

4.9.5.4 Salmonoid Values

As detailed in Cawthron 2025, as with other fisheries in the Waitaki catchment, the Takapō River contains brown and rainbow trout. Sockeye salmon also occur in the river periodically, as they run up from Lake Benmore to spawn. Salmonid habitat in the Takapō River is usually limited to below the Fork Stream confluence where there are substantial permanent flows.

Prior to the arrival of didymo, the Takapō River supported a very popular and highly regarded trout fishery. During that time, the existing operation of the Tekapo PS likely had positive effects on salmonid abundance in the Takapō River, due to reduced fine sediment and improved water clarity resulting from diversion of glacial Takapō water. Angler use has declined since the appearance of didymo, but the Takapō River continues to be a moderately popular fishery compared with other rivers throughout New Zealand. The decline in angling use aligns with the result of surveys of trout abundance in the Takapō River in 2021 (discussed further in subsequent sections of this AEE), which showed trout abundance was about half of that reported prior to didymo arrival.

However, despite these adverse changes associated with didymo, trout abundance in the Takapō River is still in the top 30% of New Zealand rivers where comparable data are available.

4.10 LAKE PŪKAKI

4.10.1 Natural Character

Boffa Miskell Landscape, 2023 consider that the natural character of Lake Pūkaki is "Moderate", with the assessment noting that Lake Pūkaki is a modified natural lake, due to structures and lake level variability as its use for hydro-electricity storage. The artificial management of the lake levels for hydro storage (by Meridian) mask the natural seasonal level fluctuations. Modifications to the lakebed and margin include the outlet from the Tekapo Canal (Tekapo B) and outflow from the lake to Meridian's Ōhau Power Stations.

As with Takapō, Lake Pūkaki is a dominant natural feature of the basin with its bright turquoise colouring contrasting with the surrounding hills. Experientially, the lake retains moderate natural character (with the exception of the area around the structures associated with the Tekapo PS and WPS).

4.10.2 Water Quality and Ecological Values

Water levels in Lake Pūkaki are managed by Meridian Energy for electricity generation purposes. The lake receives water discharged from the Tekapo Canal. The lake is

microtrophic (very low nutrient levels) and, like Takapō, has naturally high turbidity owing to glacial flour in the water derived from the large proportion of glaciation within the catchment.

Lake Pūkaki has low macroinvertebrate diversity and supports native fish populations including kōaro, upland and common bullies, and a remnant population of longfin eels. Brown and rainbow trout are also present, and land-locked sockeye salmon which have become more abundant in recent years. Water entering the lake via the Tekapo Canal has excellent water quality, slightly better than that of the receiving environment.

4.11 LAKE BENMORE

Water levels in Lake Benmore are also managed by Meridian Energy. The lake consists of two, essentially independent, flooded river valleys, the Ahuriri Arm to the south (receiving water from the Ahuriri River) and the Haldon Arm to the north. The Haldon Arm receives water from the Takapō River as well as water from the Ōhau Canal (a Meridian Energy asset).

Water quality in Lake Benmore is generally good. The lake has a ten year mean trophic level index ("**TLI**") score of 2.18, classifying it as oligotrophic. The possibility that didymo and other periphyton sloughed from the Takapō River during large flow releases affects water quality in the Haldon Arm was modelled as reported in Cawthron 2025. The modelling assessed a 'worst case scenario' for didymo biomass in the Takapō River and assumed very high scouring and transport rates. The results showed that there is negligible risk from didymo and other periphyton accumulations to dissolved oxygen in Lake Benmore.

4.12 LANDSCAPE AND VISUAL AMENITY

Boffa Miskell Landscape, 2023 provides detail of the existing environment in respect of landscape and visual amenity values as it relates to the Tekapo PS as a whole. The landscape values are summarised below:

a. The characteristics and values of the wider Mackenzie Basin area include: the openness and vastness of the landscape; tussock grasslands; the lack of houses and structures; residential development limited to small areas in clusters; the form of the mountains, hills and moraines encircling and/or located in the Mackenzie Basin and undeveloped lakesides and SH8 roadside;

b. These characteristics have been influenced over hundreds of years of human modification. Takapō, Lake Pūkaki and the Tekapo Canal, whilst being a man-made feature, are prominent and act as defining, legible and memorable features of the Mackenzie landscape. The natural dynamics of the Takapō River system are modified by an artificial flow regime, throughout the river's entire length, and noticeably within the first 7km, where no minimum flow is established. However,

whilst modified, the lakes and canal system provide moderate aesthetic values, as does the river;

c. The canals are also popular for sports such as fishing (salmon and trout), with kayaking occurring in the upper Takapō River and slalom course during flow releases. Furthermore, the lake margins prove popular for recreational activities, with walking and biking tracks along some of the banks;

d. The hydro schemes were developed with landscape design input at the engineering design stage, and significant landform and grassland reinstatement in the construction phase which resulted in the high degree of landscape integration now seen; and

e. The hydro schemes themselves hold historical association for the local area.

Visual amenity describes the pleasantness and aesthetic coherence of a place and comprises the visual and aesthetic aspects of amenity with the following matters to be considered in respect of visual amenity:

a. **In river** – flow level, wetted surface / dry channel, substrate / rock material, water clarity, water colour, water movement and light reflection;

b. **River / lake margins** – vegetation, levels of human modification, (e.g., structures, buildings), seasonal colour, nature of exposed river / lake margin (e.g., substrate of margin, algal proliferations), sounds and smells associated with the waterbodies; and

c. **Visibility and viewing audience** – the nature and size of the viewing audience, with some reaches / areas more accessible and visible than others; their sensitivity e.g., recreational / residential audiences have a greater level of sensitivity than passing traffic or workers.

The aspects of the operation of the Tekapo PS that change the natural processes and have the potential to affect the visual amenity are:

a. Noticeable drop in river / lake water level and / or a change in the regular pattern of level fluctuations;

b. Any changes to the clarity of the water in the lake or river resulting from operation of the scheme (which may include sedimentation, periphyton or an increase in the extent of a muddy shoreline); and

c. Changes to the character of the lake and riverbanks through flooding, erosion or debris.

Boffa Miskell Landscape, 2023 details that the Mackenzie Basin as a whole displays very high levels of visual amenity, recreational and perceptual values. This is reflected in the

area's predominantly broad natural appearance, expansive views and relative low levels of apparent modification, where modifications (including the hydro scheme and farming practices) contrast with the predominance of natural elements.

The upper Takapō River is largely dry and has been since the commissioning of the scheme in 1951. Occasional flows do pass through this reach, but they are only of a limited duration. Some minor groundwater inflow is recorded between Lake George Scott and Fork Stream. Beyond Fork Stream, permanent flow within the Takapō River considerably improves the natural amenity values, where open views of the wider river corridor are appreciated.

The key landscape and visual amenity values associated with the area include:

a. Views of Takapō, Mount John, the mountains and the glacial lakes;

b. The Alps to Ocean walking and cycling track follows alongside the Tekapo Canal and Lake Pūkaki, and forms part of the Te Araroa Trail, enabling good views to the river and lakes for recreationalists that can be enjoyed away from busy public roads and viewpoints;

c. The relatively open, settled, rural landscape means that views incorporating Takapō and surroundings are pleasantly scenic; the expansive views provide an experience of openness with an attractive mountain backdrop; and

d. Rich transient values associated with the seasons and changes of the lake levels and river flow. The impressive weather and cloud patterns of the Mackenzie sky are renowned together with the distinctive night sky.

4.13 GEOLOGY AND GROUNDWATER

4.13.1 Geological setting

As detailed by PDP 2025, the Mackenzie Basin is a tectonic depression, which has been infilled as a result of the erosion of greywacke and schist associated with uplift of the alpine fault.

The basement rocks are predominantly greywacke, associated with the Torlesse Supergroup, which outcrops in the surrounding ranges. This is overlain by weathered greywacke conglomerate (associated with the Glentanner Formation), which is in turn overlain by glacial deposits, consisting of glacial tills and glacial outwash gravels, deposited during four major advances. There are alluvial deposits at surface in places (post glacial), which occur predominantly within and around present-day river systems, including the Takapō River. Around Takapō, the predominant geology is glacial till, with alluvial deposits around the inflowing rivers and sand and gravel beach deposits bordering the lake in places.

4.13.2 Groundwater Flows and Levels

Groundwater, both vertically and laterally in the deeper system, is likely to be highly variable and it is unknown whether the groundwater system is connected at depth. The CRC's interpreted groundwater contours on Canterbury Maps show groundwater flow to generally be parallel to the Takapō River and Lake Benmore.

Water level monitoring was undertaken by PDP in six existing bores located more than 400 m from the Takapō River that were all deeper than 6 m. The monitoring shows that:

a. Bores closer to the river displayed strong responses to flow (and corresponding stage height changes) in the Takapō River compared to bores located further away from the river;

b. Water levels within the deeper monitoring bores responded strongly to diverted flows from Edwards and Sawdon Streams within a manmade diversion channel located upgradient of two bores monitoring by PDP, likely as a result of flow losses to ground in this area of the basin. The changes in water levels within these bores as a result of the diverted flow were much larger compared to the smaller effect of changes in flow within the Takapō River;

c. To the west of the Takapō River, a similar response to flow/stage height within the nearby reach of Irishman Creek caused increases in water level within a monitored bore, although no response appeared to occur from changes in flow in the Takapō River. A small response (around 0.07 m) was observed in a bore located around 1 km west of the Takapō River, from flow changes in the Takapō River but the response measured in this bore was considered to be smaller than the natural water level variations observed in this bore; and

d. Groundwater monitoring was undertaken in eight shallow (<6 m deep) bores located within 160 m of the Takapō River. The water level monitoring data measured in these bores showed that they all generally displayed a strong response to flow and corresponding stage changes in the Takapō River.

PDP also undertook piezometric surveys which shows that groundwater flows parallel to the Takapō River from the middle reaches to downstream of Grays Hills. Along the upper reaches, directions are more complex indicating that groundwater flows toward the Takapō River with groundwater tending to flow more parallel to the river further downstream.

4.13.3 Groundwater Quality

Takapō

There is limited groundwater quality information around the lake. However, the Tekapo PS scheme is not considered to have a direct influence on groundwater quality and any indirect influence, for example a reduction in the unsaturated zone at higher lake levels.

Takapō River

A review of existing groundwater quality data was undertaken by PDP which indicated that groundwater quality within the Takapō River Basin is relatively good, although slightly elevated concentrations of some parameters, (*E.coli*, nitrate-N) have been observed occasionally in some bores but likely reflect localised upgradient land use unrelated to the Tekapo PS.

4.13.4 Groundwater Users

Takapō

There are a small number of domestic supply bores around Takapō that could potentially be affected by lake level fluctuations. However, these bores have all been installed since 2000 (post-scheme).

Takapō River

PDP 2025 reviewed the CRC database, and notes that there appear to be no recorded bores used for taking water near the Takapō River such as drinking water supply or irrigation use near the Takapō River, with the exception of a surface water take (for irrigation of crops and pasture) via an infiltration gallery on the lower reaches of the Takapō River. This consent was granted on 7 May 2007, a significant time after the Tekapo PS was already in place, meaning the infiltration gallery and take was designed based on the current flow pattern in the Takapō River and groundwater levels.

There are no other surface water take consents along the main stem of the Takapō River.

4.14 TERRESTRIAL ECOLOGY

4.14.1 Terrestrial Invertebrates

A description of the existing environment as it relates to terrestrial invertebrates is provided in the terrestrial invertebrate report[127] prepared by Entecol ("**Entecol 2025**"). This report is attached as **Appendix O** to this AEE and is summarised below.

[127] A Review of Terrestrial Invertebrate Information for the Tekapo Power Scheme Resource Consents, Entecol Report: ENT-063, 2025. Prepared by CP Ong & RJ Toft (Entecol Limited) for: Genesis Energy Limited.

A range of invertebrates with known conservation significance have been recorded from the wider Takapō and Lake Pūkaki area, with a subset of these associated with braided rivers and most likely to be affected by the Tekapo PS. This includes spiders, stiletto and robber flies, grasshoppers, Tekapo ground weta, moths, and some true bugs. The storage and diversion of water associated with the Tekapo PS alters natural flow regimes and sediment transfers downstream. The river systems of the Tekapo PS are braided rivers, and braided rivers naturally undergo repeated perturbation of the riverbed. Reduced flows and flood attenuation from hydro schemes can modify natural sedimentation and channel forming processes. This in turn may adversely affect downstream biota that have adapted to live in braided river environments, including terrestrial invertebrate species.

Invertebrate communities within the Mackenzie Basin generally have been affected by many factors, particularly habitat loss through expanding agricultural activities such as pastoralisation and irrigation.

An overview of the species of known conservation significance identified as being present within the Mackenzie Basin (along with their respective conservation status) is set out below:

Spiders:	Wolf spider *Anoteropsis arenivaga* (At risk – naturally uncommon); and
	Gnaphosid spider *Matua festiva* (Data deficient).
Beetles:	Darkling beetle *Artystona lata* (At risk – naturally uncommon);
	Ground beetles *Holcaspis falcis* (At risk – declining) and *Holcaspis bidentella* (Threatened – nationally critical); and
	Scarab beetles *Prodontria matagouriae* (At risk – naturally uncommon), and *Prodontria minuta* (At risk – naturally uncommon).
Stiletto Flies:	*Anabarhynchus albipennis* (Data deficient), *Anabarhynchus indistinctus* (Data deficient) and *Anabarhynchus harrisi* (At risk – naturally uncommon).
Robber Fly:	*Neoitamus smithii* (At risk – naturally uncommon).
Grasshopper:	*Brachaspis robustus* (Threatened – nationally endangered)
	Sigaus minutus (Threatened – nationally vulnerable); and
	Phaulacridium otagoense (At risk – declining).
Weta:	Mountain stone weta *Hemideina maori*; and
	Tekapo ground weta *Hemiandrus "furoviarius"* (Threatened – nationally endangered).

Moths: Lichen tuft moth *Izatha psychra* (Threatened – nationally endangered);

Carpet moth Xanthorhoe bulbulata (Threatened – nationally critical);

Plains jumper moth *Kiwaia* 'plains jumper' (Threatened – nationally endangered);

Grays River grass moth *Orocrambus fugitivellus* (Threatened – nationally critical);

Diurnal looper moth *Paranotoreas fulva* (At risk – relict); and

Eurythecta robusta (At risk – naturally uncommon), *Graphania tetrachoa* (Data deficient) and *Pasiphila* sp. 'Olearia' (Threatened – nationally vulnerable).

Seed bugs: *Lepiorsillus tekapoensis* (Data deficient), *Rhypodes triangulus* (Data deficient) and *Nysius liliputanus*.(At risk – naturally uncommon).

Mirid bug: *Pimeleocoris roseus* (Threatened – nationally critical).

Entecol 2025 also notes that even if the Tekapo PS was not operating, weeds and predators would still exist as major threats to terrestrial invertebrates on braided rivers.

4.14.2 Herpetofauna

RMA Ecology Ltd 2023[128] provides an assessment of the existing reptile and amphibian values (together, 'herpetofauna') of the Tekapo PS, and focusses on the land areas within the existing Tekapo PS footprint (for canal areas), within 200 m of the Takapō River, and 50 m of the Takapō and Lake Pūkaki margins. This report is attached as **Appendix P** to this AEE and is summarised below.

Twenty individual sites were assessed by RMA Ecology, covering lakeside, canal, and Takapō River margins. Together these sites covered an area of around 100 ha. An estimated 40 ha of that area was searched for lizards to detect presence (based on the percentage searched of each site). A total of 200 lizards were recorded from within the sites.

The assessment's findings were as follows:

a. Three species of native lizard were recorded – McCann's skink, Southern Alps gecko and Canterbury grass skink;

[128] Tekapo Power Scheme re-consenting, Tekapo Herpetofauna Effects Assessment, Job 2004, 2023. Prepared by G Ussher (RMA Ecology Ltd).

b. Southern Alps gecko and McCann's skink were found across most sites; relative abundance differed between sites but was generally inversely related to the level of past disturbance of the site;

c. At the Takapō River margin sites, Southern Alps gecko and McCann's skink occupied all habitat areas including river bank, terrace, riser, pebble and boulder-bank areas. Populations of these species along the margins of the Takapō River and its associated dry channels, floodplain areas and historic terraces would likely number in the 1,000's per kilometre of river;

d. Canterbury grass skink was found at one site – along the riparian margins of a minimally disturbed section of the Mary Burn near a culvert section of the Tekapo Canal;

e. No other lizard species were recorded; jewelled gecko, scree skink, long-toed skink or Mackenzie Basin skink were not found within the study locations; for all of those species, habitat quality within the survey areas was poor and generally lacked key habitat aspects with which these species are usually associated; and

f. No exotic lizards or frogs were recorded.

4.14.3 Avifauna

An assessment of existing avifauna is provided in the BlueGreen Ecology avifauna report ("**BlueGreen Avifauna, 2025**")[129]. This report is attached as **Appendix Q** to this AEE and is summarised below.

Takapō River, Takapō and surrounding areas provide habitat for a diverse range of bird species, with a total of 63 avifauna species recorded by the OSNZ atlas programmes (1985 and 2004), other literature sources, and the field investigations in the Tekapo area. Due to the nature of the Tekapo PS, the BlueGreen Avifauna, 2025 assessment focuses on waterbird species as they are the group most likely to be affected by the Tekapo PS. Therefore, of 63 species recorded, 38 of those are affiliated with freshwater environments.

The following table, reproduced from the BlueGreen Avifauna, 2025 assessment, provides an overview of the birds recorded in Takapō, the Takapō River and the surrounding environment.

[129] Tekapo Re-Consenting: Assessment of Ecological Effects – Avifauna, 2025. Prepared by BlueGreen Ecology Limited. The assessment was initially prepared by Dr L Bull while employed by Boffa Miskell Limited. Dr Bull is now a Senior Ecologist / Director at BlueGreen Ecology Ltd and has updated the report for inclusion in this application.

Table 15: Freshwater Birds Associated with Takapō, Takapō River and the Surrounding Environment.

Species	Threat Classification	Primary Freshwater Habitat
Australasian bittern	Threatened – Nationally Critical	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Black-billed gull	Threatened – Nationally Critical	Rivers & Estuaries, river mouths and bar-type lagoons
Black stilt / Kakī	Threatened – Nationally Critical	Rivers & Estuaries, river mouths and bar-type lagoons
Grey duck	Threatened – Nationally Critical	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
White heron	Threatened – Nationally Critical	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Black-fronted tern	Threatened – Nationally Endangered	Rivers & Estuaries, river mouths and bar-type lagoons
Banded dotterel	Threatened – Nationally Vulnerable	Rivers & Estuaries, river mouths and bar-type lagoons
Caspian tern	Threatened – Nationally Vulnerable	Rivers & Estuaries, river mouths and bar-type lagoons
Southern crested grebe	Threatened – Nationally Vulnerable	Lakes and ponds
Wrybill	Threatened – Nationally Vulnerable	Rivers & Estuaries, river mouths and bar-type lagoons
NZ pied oystercatcher	At Risk – Declining	Rivers & Estuaries, river mouths and bar-type lagoons
NZ pipit	At Risk – Declining	Rivers & Estuaries, river mouths and bar-type lagoons
Red-billed gull	At Risk – Declining	Estuaries, river mouths and bar-type lagoons
Pied shag	At Risk – Recovering	Estuaries, river mouths and bar-type lagoons
NZ dabchick	At Risk – Recovering	Lakes and ponds
Black shag	At Risk – Naturally Uncommon	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Royal spoonbill	At Risk – Naturally Uncommon	Estuaries, river mouths and bar-type lagoons
Marsh crake	At Risk – Relict	Lakes and ponds & Estuaries, river mouths and bar-type lagoons
Black-backed gull	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Black swan	Not Threatened	Lakes and ponds & Estuaries, river mouths and bar-type lagoons

Species	Threat Classification	Primary Freshwater Habitat
Grey teal	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Kingfisher	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Little shag	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
NZ scaup	Not Threatened	Lakes and ponds
NZ shoveler	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Paradise shelduck	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Pied stilt	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Pukeko	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Spur-winged plover	Not Threatened	Rivers & Estuaries, river mouths and bar-type lagoons
Welcome swallow	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
White-faced heron	Not Threatened	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Australian coot	Coloniser	Lakes and ponds
Canada goose	Introduced & Naturalised	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Feral goose	Introduced & Naturalised	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Mallard	Introduced & Naturalised	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Mute swan	Introduced & Naturalised	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
Chestnut-breasted shelduck	Vagrant	Lake and ponds, Rivers & Estuaries, river mouths and bar-type lagoons
White-winged black tern	Migrant	Rivers & Estuaries, river mouths and bar-type lagoons

Of the waterbirds recorded associated with Takapō, Takapō River and surrounds, four endemic species have evolved on braided rivers (wrybill, black stilt / kakī, black-billed gull and black-fronted tern) while a further two endemic species (banded dotterel and NZ pied oystercatcher) use braided rivers as their major breeding habitats.

There are six specialised river bird species of high conservation value for which the Tekapo PS has likely to have affected following its construction due to the changes to foraging and / or breeding habitat, as follows:

a. Aerial hunting gulls and terns: Black billed gull and Black-fronted tern;

b. Deep water waders: Black stilt / kakī and NZ pied oystercatcher; and

c. Shallow water waders: Banded dotterel and Wrybill.

Overall, the BlueGreen Avifauna, 2025 assessment details that the construction of the Tekapo PS resulted in the loss of braided river and swamp / wetland habitat but increased open water (lake) and lake shoreline habitat. This remaining habitat forms part of the existing environment.

It is also noted that PRR has played a role in increasing the numbers of specific water birds in the catchment, in the catchments upstream of the Tekapo PS.

The BlueGreen Ecology avifauna analysis of the difference in abundance of birds recorded in the most recent comparable surveys to those at the start of PRR, shows significant increases over that time for a number of species upstream of the Tekapo PS and where PRR management is occurring. During the same time period, there were no increases in abundances detected in areas downstream of the WPS. This would suggest that PRR measures are providing benefits for banded dotterel, black-billed gull, black-fronted tern and NZ pied oystercatcher. Of particular note is the significant increase in abundance of NZ pied oystercatcher and banded dotterel recorded in catchments above the Tekapo PS where PRR management is occurring, as these trends are contrary to the national population trends recently reported (which showed declining trends).

4.14.4 Vegetation

A description of the existing environment as it relates to vegetation is provided in the Ecological Solutions vegetation report ("**Ecological Solutions 2023**").[130] This report is attached as **Appendix R** to this AEE.

Takapō and surrounds, along with most of the Tekapo Canal, are located within the Tekapo Ecological District. The north-western edge of the lake and the Godley River immediately upstream of the lake are within the Godley Ecological District, while the area south of the outlet of Takapō, including a short section of the canal and the Takapō River and surrounds, are located in the Pūkaki Ecological District. The Mackenzie Ecological Region comprises seven ecological districts (Tekapo, Pūkaki, Grampians, Benmore,

[130] Tekapo Power Scheme Reconsenting Assessment of Effects – Vegetation, 2023. Prepared by Ecological Solutions Limited.

Omarama, Ahuriri and Ben Ōhau) and extends from the northern side of Takapō, south to the ranges on the southern side of the Ahuriri River.

In order to describe the vegetation surrounding the elements of the Tekapo PS surveys were undertaken in various plots around the lake edge, along the Takapō River and in specific wetlands as reported in Ecological Solutions 2023. The results are summarised as follows:

Lake Edge Vegetation

1. Taken together, the average cover of the 32 lake edge plots comprised approximately 65% rock and/or gravel, 4.5% silt and/or sand, 1.6% moss, 0.9% algae and 2.2% litter. Of the remaining 26%, approximately 6% comprised indigenous vegetation and 20% comprised exotic vegetation; and

2. The lake edge vegetation varies in quality from low (sparse, predominantly exotic e.g., exotic herbs growing between cobble and boulders) to moderate (includes more native species, representative and demonstrates ecological gradients e.g., matagouri shrubland or some turf vegetation).

Wetland Vegetation

1. The majority of wetlands in the upper Waitaki area (85%) have been subjected to significant modification;

2. A total of 83 species were recorded in the 28 wetland plots surveyed by Ecological Solutions. Generally, the wetland plots included a higher proportion of native species cover (36%) than either the lake edge or river edge plots;

3. The average percentage cover of native species per plot was approximately 22%, with rock occupying 4%, bare soil 7.4%, moss 8.6%, water 1.9%, litter 10.2% and the remainder (56%) comprising exotic vegetation; and

4. The average wetland condition index was 19.3 out of a possible 25, with the average pressure score of 16.1 out of a possible 30. This is indicative of comparatively good quality wetlands with a low degree of modification and low – medium external modification pressures. On that basis the wetlands are typically of high – very high ecological value.

Takapō River Vegetation

1. Dewatering the upper Takapō River has affected the adjacent river flats and wetlands within the floodplains by reducing (or removing) water supply. The reduction in flood events will have reduced the natural process of erosion – deposition – aggradation within those sections of the braided river, which will in turn have created a more stable environment for vegetation, altering the

frequency of disturbance and allowing species composition to change. This has resulted in a more stable river bed with reduced reconfiguring and therefore reduced creation of newly disturbed gravel habitats for early colonising species relative to the pre-existing state. River training and other activities (not undertaken by Genesis) intended to prevent flooding, erosion and the natural meander of watercourses have also affected the natural character and dynamics of the Takapō River, but the full extent of works carried out there is unknown;

2. Thirty-three species were recorded from the ten plots along the Takapō River reported in Ecological Solutions 2023 which averaged 59% rock and/or gravel, 9.5% silt and/or sand, 1.5% moss, 1.4% litter and 28.6% vegetation. Six of the species recorded (18%) were native. The vegetation averaged 9.1% native vegetation (mostly comprising small-leaved pohuehue, 8.5%) with a variety of native grasses or sedges (*Austroderia richardii, Rytidosperma* sp., Poa sp., Carex sp.) present as a minor component. The only native herb present was *Raoulia* sp., possibly R. *parkii*, which was present in one plot; and

3. Riverine vegetation was typically sparse and predominantly (~70%) exotic and of low ecological value.

In terms of plant species of conservation interest, only one species which is regarded as "threatened (nationally vulnerable)", *Carmichaelia corrugata*, dwarf common broom, was detected during the surveys, in short tussock grassland near the Tekapo Canal. In addition, nine species which are regarded as "at risk (declining)" were detected including coral broom (*Carmichaelia crassicaulis*), *Carmichaelia petriei*, *Coprosma brunnea*, *Coprosma intertexta*, matagouri, *Colobanthus brevisepalus*, *Raoulia parkii*, *Raoulia australis* and Buchanan's sedge (*Carex buchananii*). The majority of these species, including the dwarf common broom, were seen in short tussock grassland or other habitats near the Tekapo Canal. One specimen of R. *parkii* was detected on the roadside and a second in cobble habitat near the Takapō River. Matagouri was more widespread and was detected in habitats around Takapō and Lake Pūkaki as well as along the Takapō River. Matagouri commonly co-occurred with brier rose and mikimiki and with depleted hard tussock grassland at some locations.

4.15 RECREATION AND TOURISM VALUES

An assessment of the existing recreational and tourism environment relating to Takapō, the Takapō River and the Tekapo Canal was undertaken by Rob Greenaway & Associates

and their report ("**Rob Greenaway & Associates 2023**")[131] is attached as **Appendix S** to this AEE and is summarised below.

Table 16 summarises the significance of the waterbodies influenced by the operation of the Tekapo PS by activity at the regional, national and international level.

Table 16: Recreation Significance by Waterbody

Waterbody	International Significance	National Significance	Regional Significance
Takapō	Scenic Values	A range of activities, including boating and angling	
Takapō River			Angling, jet boating and kayaking
Tekapo White Water Course		Kayaking	
Tekapo Canal		Angling, cycling and walking	

More detail is provided below:

a. Salmon and trout fishing are popular throughout the Mackenzie Basin. Fishing within the Tekapo Canal is particularly popular in close proximity to the salmon farm and Tekapo A. The Waitaki catchment accounts for around 80% of all angler activity in the Central South Island Fish and Game Region in the 2014/2015 season, and in that same season 30% of all angler days in the region occurred on hydro canals (of which the Tekapo Canal is one);

b. Recreational activities on Takapō include sightseeing, the Alps 2 Ocean Cycle Trail, swimming, boating and water skiing and angling;

c. Takapō has generally a low level of ecological productivity due to the glacial flour. It fishes best at low levels when anglers can access the more stable and productive parts of the water. At high levels, shore-based anglers are fishing over bare cobbles with little plant or insect life;

d. The appeal of water skiing in the catchment, specifically at Takapō, is the scenery and the ease of access to the lake. Additionally, there is a large area that a lot of boats and other recreational users can use. Over the past 20 years the number of

[131] Tekapo Hydro Scheme Reconsenting Recreation Review, 2023. Prepared by Rob Greenaway & Associates.

visitors to Takapō has steadily increased, and more make use of the water, especially boaters – potentially due to an increase in launching options. It has become more difficult to water ski in some parts of the lake as new navigation bylaw restrictions reduce the amount of water than can be used, and with an increase in the number of boats and the introduction of a swimming bay where water ski slalom was normally held;

e. There is a perception that lake levels are more variable and tend to be held lower for longer since Genesis has been operating it. This impacts negatively on water sports and boat launching, along with exposing more sub-surface hazards. High lake levels are preferred. Lake levels can affect the scenic value of Takapō; for example (for aerial flights) a lake level reduction of two to three metres in the water level results in the lake appearing significantly smaller;

f. The Takapō River has been substantially modified by the Tekapo PS and, as a result, has become an important trout angling setting below Fork Stream (albeit prior to the problems associated with didymo which has been discussed in previous sections of this AEE);

g. Fishing in the Takapō River occurs wherever there is water, but Fork Stream is the normal upper limit for activity – and Fork Stream is a fishery in itself;

h. Between 8 and 15 annual water releases are made into the Tekapo Whitewater Course administered by the Tekapo Whitewater Trust. Funds can also be made available for course development. It is understood that prior to the development of the Tekapo PS, the Takapō River had good white water over the first 7km, whereas the lower river was prone to willow obstructions in the braided river channels;

i. Based on interviews, it is considered that the dry upper Takapō Riverbed is seen as an "eyesore," with opinions indicating that a continuous minimum flow may resolve this;

j. The Tekapo Canal is one of the most popular sports fisheries for trophy trout and salmon, and it is highly productive. The Canal also has high scenic value;

k. The upper 7 km and lower 4 km of the Tekapo Canal Road is open to public vehicles. The whole length of the Tekapo Canal Road is open to the public for pedestrian and cycle access. The canal road is primarily used by people cycling the Alps 2 Ocean cycle route, walking the Te Araroa Trail, visiting the salmon farm or wanting to utilise the canal for fishing, or access to the upper Takapō River. Swimming and boating within the Tekapo Canal are prohibited; and

l. Genesis also provides and maintains permanent toilets for public use at several locations along the Tekapo Canal Road.

Based on the analysis and interviews undertaken by Rob Greenaway & Associates 2023, the operation of the Tekapo PS has been consistent from 1990 up until the past three to five years. These include perceptions of more frequent and lower levels at Takapō, attributed to environmental factors, increased demand and an alternative operational regime adopted by Genesis (in comparison to Meridian Energy).

Construction of the intake gate for the Tekapo A Power Station and canal re-lining works have been associated with short-term loss of kayaking opportunities on the Tekapo White Water Course and the Takapō River. It has also been associated with increased siltation in Lake George Scott.

Otherwise, the study area has been viewed as stable, besides major weather-related events causing site-specific erosion events.

4.16 OTHER WATER USERS

The Upper Waitaki Zone Implementation Plan ("**ZIP**") provides an overview of the types of activities within the upper Waitaki:

a. The ZIP details that the Waitaki Catchment is of national importance for power generation and security of supply. The ZIP notes that the WPS has combined generation capacity of over 1,700 MWh and an annual output of about 7,700 GWh, contributing nearly 20% of New Zealand's annual electricity requirements and 30% of New Zealand's total hydro generation;

b. The MDC provides water reticulation to the Tekapo, Twizel and Fairlie townships. In addition, MDC holds a number of resource consents for "domestic and stockwater supply;"

c. Many homes in the rural areas obtain their water from small private community schemes, individual private bores and surface water takes; and

d. There is approximately 9,000 hectares of irrigation in the zone, and the ZIP sets out that the WAP provides an allocation for irrigation[132] that could irrigate a further 25,000 hectares (subject to meeting water quality and landscape/ecological constraints).

The outcomes developed by the Zone Committee include maintaining or increasing the contribution to the Zone's economy from agriculture, aquaculture and the Zone's existing contribution to New Zealand's electricity supply.

[132] The Tekapo Canal infrastructure enables access to water for irrigation, subject to agreement with Genesis regarding access. Genesis does not provide water for irrigation and the consents sought by Genesis do not include water for irrigation. Irrigators must obtain their own resource consents and manage their operations in accordance with those resource consents.

5. ASSESSMENT OF ENVIRONMENTAL EFFECTS

5.1 INTRODUCTION

This section addresses the actual and potential effects associated with the operation of the Tekapo PS on the existing environment described in the previous section of this AEE. Again, it is noted that the assessment of the actual and potential effects focusses on the effects of the on-going operation of the scheme on the values currently supported by waterways influenced by the operation of the Tekapo PS.

As noted earlier in this AEE, several technical assessments have been commissioned by Genesis to inform this AEE and are provided in full as appendices to this AEE. The various technical assessments are summarised and referenced, as appropriate, in the applicable sub sections. This AEE should be read in conjunction with the technical assessments.

In summary, section 5 addresses the following matters in respect of the waterbodies within the area of influence of the Tekapo PS:

a. Decarbonisation and economic effects;

b. Cultural effects

c. Natural character, landscape and visual amenity effects;

d. Hydrological effects;

e. Freshwater ecology and water quality effects;

f. Shoreline morphology;

g. Terrestrial ecology effects;

h. Dam safety and flood management; and

i. Recreation effects.

Several measures to avoid, remedy or mitigate the potential effects of the ongoing Tekapo PS activities are identified in this section of the AEE, as well as in the following section. These measures are captured in the indicative draft consent conditions proposed by Genesis in **Appendix D**.

5.2 DECARBONISATION AND ECONOMIC EFFECTS

The decarbonisation and economic benefits provided by the Tekapo PS contribute significantly to local, regional and national communities. The Tekapo PS has been part of the environment of the Mackenzie Basin for several decades and directly provides (on

average) approximately 1,870 GWh[133] of electricity generated to the national grid. The continued operation of the Tekapo PS, in the manner sought by Genesis, would enable these benefits to be maintained.

The utilisation of water diverted from the Takapō River by the Tekapo PS for the sustainable generation of electricity positively contributes to New Zealand's renewable energy productivity, and the continued operation of the Tekapo PS would ensure that Genesis can maintain at least the present level of electricity generation it controls from renewable energy sources.

The Tekapo PS and the combined WPS are of national importance, and their operation are critical to achieving New Zealand's climate change target of net zero emissions of all greenhouse gas ("**GHG**") emissions other than biogenic methane by 2050 under the Climate Change Response Act. New Zealand also has a Nationally Determined Contribution under the Paris Agreement to reduce net GHG emissions to 50 per cent below gross 2005 levels by 2030. Continued generation at present levels from the Tekapo PS is also critical to meeting this international commitment.

The electricity sector benefits derived from the Tekapo PS have been assessed in Concept 2025,[134] attached as **Appendix G** to this AEE and summarised below.

Electricity is vital in daily New Zealand life, with many social and economic benefits stemming directly from technologies relying on electricity. It is anticipated that electricity will become even more important as New Zealand moves to decarbonise the economy using renewable generation sources.

To meet its decarbonisation objectives, New Zealand will in future need to develop new generation sources at an unprecedented rate. Much of that generation will be from wind and solar power. Although these are very cost competitive, their output is subject to fluctuations due to weather, etc.

Achieving New Zealand's decarbonisation goals will require the development of around 1,100 GWh of new generation capability every year until 2050. This pace of development is almost 2.5 times the rate achieved in the last 25 years.

To provide a sense of scale, this is roughly equivalent to adding a new set of Tekapo A and B stations to the electricity system every 11 months until 2050, assuming all existing renewable stations (including Tekapo A and B) retain their current generation capabilities

---

[133] This only includes electricity generated at the Tekapo A and B stations and does not include additional generation by Meridian Energy using water that has passed through the Tekapo PS that would not otherwise be available to the Meridian power stations.

[134] Including both direct and indirect output based on average levels between 2000 and 2024 but excluding 2012-14 when output was reduced due to major remedial work on the Tekapo canal, see Tekapo Power Scheme – electricity sector benefits, 2025. Prepared by Concept Consulting Ltd.

after their current resource consents expire and that their operating capabilities will not be reduced during reconsenting processes.

While batteries are expected to help in smoothing out much of the very short-term fluctuation in supply from these sources, they are not suitable for addressing variations which occur from week to week or longer so other sources of flexibility are required. This will include hydro generation that has access to stored water which has the twin benefits of being renewable and controllable, both of which will be increasingly important as New Zealand decarbonises its economy. The Tekapo PS provides both.

The Tekapo PS generates substantial volumes of 100% renewable electricity, with an average annual output (from both direct and indirect generation) sufficient to supply approximately 228,000 Canterbury households.

Replacing the Tekapo PS output with alternative renewable sources would impose additional costs on society of around $100 to $125 million per year. Furthermore, it would take time to construct the alternatives, likely creating a need for increased thermal generation in the meantime. The annual costs for that generation would be approximately $160-$310 million per year. Increased thermal generation would also significantly raise New Zealand's GHG emissions, by the equivalent of 400,000 to one million cars per year while it was operating.

An important feature of the Tekapo PS is that there is significant ability to vary the energy output to match system conditions. This helps to maintain reliable electricity supply to consumers. The cost estimates above are expected to be conservative because they do not account for the economic premium that applies to controllable generation sources. Furthermore, this premium is expected to rise as the need for renewable controllable generation increases with decarbonisation of the economy.

In addition to its contribution to national electricity supply, the Tekapo PS provides power to consumers in the Tekapo Albury region when that area is periodically cut-off from the rest of the grid. Without the Tekapo A station, an alternative electricity source would need to be developed as a local back-up. This would be expected to cost around $17 million in present value terms, otherwise consumers in the local area would likely experience power cuts for 200 to 250 hours per year.

In addition to electricity related benefits, the Tekapo PS has also resulted in improved fishery experiences (for introduced species) in the Tekapo Catchment, particularly within the Tekapo Canal and other opportunities for recreational experiences that attract visitors to the area. An economic impact assessment[135] of the Te Manahuna Mackenzie Basin hydro canal fishery (which includes the Tekapo, Pūkaki and Ōhau canals)

[135] "Economic Impact Assessment: Te Manahuna Mackenzie Basin Hydro Canals" prepared by J Hjelte, B Lovelock, S Hayes and V Kahuia, May 2024.

underscores their substantial contribution to the local economy, with a total economic impact of $13.6m for the 2022-2023 fishing season. This figure, derived from direct and indirect expenditure analyses, represents 3.5% of the total GDP of the region.

The hydro canals are identified as a destination fishery for anglers from throughout New Zealand and internationally in the Central South Island Fish and Game Council Hydro Canal Fishery Management Strategy,[136] attract use from Central South Island and North Canterbury based anglers as well as Otago and Southland anglers. The canals have grown in popularity between the 2007/08 and 2021/22 sports fishing seasons with an approximately ten-fold increase in use. In 2021/22 the four canal units that make up the fishery all ranked in the top ten most fished individual waters under Fish & Game NZ's management. Collectively, the usage of canals equates to approximately 12% of all freshwater fishing activity managed by Fish & Game NZ.

In summary, the Te Manahuna Mackenzie Basin hydro canal fishery plays a critical role in the local economy, not only through direct expenditures by visitors but also through substantial secondary economic benefits.

5.3 CULTURAL

Cultural matters relating to these applications are described in the TIA prepared by Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki for the Tekapo PS included as **Appendix A** to this AEE.

The TIA emphasises that:

a. Kāi Tahu have one river that unites all 70,000 iwi members – Ko Waitaki te awa. Kāi Tahu tupuna go back untold generations and many leaders are buried on lands within the catchment. Today's generation, their children's children and all the children of the generations to follow will mihi to Aoraki and the Waitaki River and will continue to identify with the importance of this particular catchment within the wider Kāi Tahu rohe.

b. The issues and impacts presented in the TIA are not concerned with maintaining the existing environment. Maintaining the current state of a highly modified catchment is not an option as the Waitaki Rūnaka firmly believe that the lands and waters of the Waitaki need to be restored, enhanced and protected. However, their concern is that a narrow focus on the rivers most affected by infrastructure and its operation to produce electricity, could result in many of the opportunities for Manawhenua and options for restoration and enhancement of mahika kai and

[136] Central South Island Region, Hydro Canal Fishery Management Strategy 2025-2027, January 2025, prepared for the Central South Island Fish and Game Council.

Kai Tahu connections with whenua and wai in the catchment as a whole, being lost or limited.

c. When assessing the impacts of the Schemes on their rights beliefs and practices, Kāi Tahu cannot only focus on the impact of the Schemes on today's generation. Using mahika kai as an example; Kāi Tahu have the right to benefit from mahika kai sourced from the catchment as long as they protect forever the integrity of what makes the Waitaki a mahika kai. A key focus therefore had to be how to enable future generations to thrive in the catchment.

When assessing the impacts of the scheme, Manawhenua realised that many of the effects of the scheme are permanent given the technology that exists at this point in time. Some whānau want to see the dams removed but know that this is not feasible and, if it becomes feasible, is not likely to give back the braided Waitaki River.

Particular effects in the Waitaki include:

1. Wāhi tapu and wāhi taoka have been inundated and lost resulting in named and active associations being broken and Kāi Tahu relationship with areas and the taoka they are supposed to sustain being weakened and damaged – in some places irrevocably.

2. Previously valuable mahika kai have been similarly destroyed and, in some instances, access to existing resources has also been adversely affected.

3. Fish movement within river systems has been disrupted; both of juveniles into the system and of mature adults attempting to leave the system. The long-term effectiveness of recent attempts to mitigate these effects on fish passage – through trap and transfer – is still uncertain.

4. Artificial lake systems are typically adopted enthusiastically by recreational users who then develop these areas as recreational fisheries and boating areas. This results in the further dilution of Kāi Tahu rights and interests in these areas.

5. As with existing water allocation regimes in waters throughout the Kāi Tahu rohe, Kāi Tahu property interests in the ownership, management, usage and access to freshwater resources are not recognised or prioritised and are subordinate to economic interests, in particular agriculture and tourism. Mahinga kai is also often incorrectly interpreted as limited to 'instream' values.

6. The natural character of the catchment is irrevocably altered.

7. The "minimum" flows are not considered adequate for the maintenance of the mauri of rivers.

8. Dam construction can have serious environmental implications and can damage fishery and other mahika kai interests, sometimes irrevocably.[137]

9. Dams have interrupted the continuity of water flow from the mountains to the sea, which conflicts with the Kāi Tahu philosophy of "Ki Uta, Ki Tai".

10. Dams trap sediment and coarser materials needed to replenish the eroding coastal environments, which are heavily used by whānau.

In relation to the Takapō system:

a. The mauri of the Takapō system has been adversely impacted.

b. Manawhenua do not know the impact of river changes on puna and repo in the Lower Takapō River.

c. Sites (including rock art) were inundated by raising lake levels in the case of the Upper Waitaki lakes and creation of new lakes in the Mid Waitaki.

d. Taoka species have been adversely impacted, especially tuna.

e. Use of the Takapō River by Manawhenua has been lost.

f. The lake environs now support uses that disconnect Manawhenua, for example increased use of motorised watercraft.

g. The lake environs now support activities that generate impacts that (over time) have become priorities for agencies, for example recreation and tourism.

In relation to the Pūkaki system:

a. The lake was raised 9m in 1952, and another 37m in 1976.

b. The tears of Aoraki do not flow unimpeded – they are now dammed.

c. The mauri of Pūkaki has been negatively impacted.

d. Sites have been inundated – "All our mahika kai lining along the lake shore were drowned".[138]

e. The Tasman Delta is directly impacted.

f. Taoka species have been impacted.

---

[137] Although dam removal is an option being explored internationally this is not seen as an option in the Waitaki at present.

[138] A comment by Trevor Howse during the tenure review process.

g. Manawhenua use of the Pūkaki River has been lost.

As a controlled activity, Manawhenua know the Schemes will be reconsented. Within the consenting process Kāi Tahu have been committed to developing directly with Generators initiatives that start everyone on a pathway to:

1. Protecting Aoraki and kā roimata o Aoraki;
2. Supporting abundant mahika kai, particularly in important wetlands, side braids, backwaters, tributaries and the Waitaki River itself;
3. Protecting the quality of the waters of the Waitaki;
4. Conserving remaining rock art sites;
5. Protecting other wāhi tapu / wāhi taoka;
6. Protecting cultural landscapes;
7. Developing more appropriate flow regimes across the catchment;
8. Ensuring variability in river flows;
9. Providing a sufficient buffer, or safety margin, to mitigate against the adverse effects of changing land uses on the waters of the Waitaki;
10. Undertaking the restoration, enhancement and creation of wetland areas, to act both as flow moderators and kōhaka for mahika kai species;
11. Enhancing access for cultural use throughout the river system;
12. Addressing issues relating to changing land uses in the catchment, in particular the increase in dairying; and
13. Protecting habitats in the lagoon.

Kāi Tahu believe that the consent conditions, the agreed package and the enhanced relationship negotiated with the Generators will enable them to adopt an intergenerational response that will enable the following adverse effects to be avoided, remedied or mitigated:

a. Any deterioration to the quality of water in the mainstem and the tributaries;

b. Unnatural changes to the sediment flow and patterns of deposition in the main river channel and at the coastal area;

c. Any encroachment of adjacent land uses onto the Waitaki riverbed;

d. The residual flow regime in the mainstem resulting in extended periods of low flows with limited flow fluctuations;

e. Residual flow regimes that fail to recognise the property interests of Kāi Tahu;

f. Any further dewatering or loss of tributaries, wetlands, side braids, springs, backwaters, adjacent to or surrounding mahika kai throughout the lower catchment;

g. Any desecration of urupā within the valley;

h. Any further loss of rock art;

i. Any further loss of access to sites of significance, especially remaining mahika kai;

j. Any further loss of mahika kai in particular habitats essential for taoka species;

k. Any reductions in the size of the lagoon, and unnatural changes to the nature and composition of the river mouth;

l. Any loss of wāhi tapu and wāhi taoka;

m. Changes in water temperature at key mahika kai affecting mahika kai; and

n. Impacts on the lakes and tributaries of the Mid and Upper Waitaki.

Waitaki Rūnaka have therefore worked collaboratively with the Generators during the consenting process to develop a package that includes:

1. Conditions that are to be attached to the resource consents that:

    a. Address issues of concern to Waitaki Rūnaka;

    b. Monitor through agreed measures issues of concern to Waitaki Rūnaka; and

    c. Collect data needed to increase understanding of the operation of the scheme in order to make informed choice for future changes.

2. A package of initiatives that will run for the duration of the consent that will provide funding for rock art conservation and eel management (including an expanded trap and transfer programme); and

3. An enhancement relationship agreement between the Generators and Waitaki Rūnaka; and

4. A funding package.

The four components of this package recognise that Te Mana o te Wai implementation requires time, capacity, commitment, collaboration and importantly resourcing. Collectively the components recognise that Waitaki Rūnaka are realistic in how far and how fast they can move towards implementing Te Mana o te Wai and realising their aspirations, without compromising on what their long-term aspirations are. The package

agreed with Generators enables Manawhenua to derive benefits while the nation retains access to the use of freshwater for renewable electricity generation.

5.4 TAKAPŌ

5.4.1 Natural Character

As detailed in Boffa Miskell Landscape, 2023, Takapō retains a variety of natural character values, from moderate for the lakes to low and moderate-low for the connecting Takapō River. The areas of highest natural character tend to be in areas furthest from modifications (which is not unexpected). In particular, the braided river deltas of the Tasman and Godley Rivers provide very high natural character at the heads of Takapō and Lake Pūkaki. The extent to which flows and levels are managed generally has an effect on the natural character of the shoreline of the lakes, reducing the natural character of the lake margins through the modification of natural patterns and processes.

Lake level is one factor that is considered to contribute to peoples' experience of lake environments. When the Takapō lake level is low, greater areas of the gravel banks and lakeshore vegetation that would otherwise typically be submerged are visible. While fluctuations in the levels also occur naturally, the extent of the lake level modification resulting from the operation of the Tekapo PS is greater than that which occurred pre-scheme construction. Boffa Miskell Landscape, 2023 considers that low lake levels in Takapō are typical indicators of the operating range which has led to a reduction in natural character.

Genesis is not proposing through these consent applications to change or introduce any new elements into the Tekapo PS and there will be no alterations through this process to the existing infrastructure or changes to the permanent Tekapo PS footprint. Genesis proposes to maintain the existing operating ranges and resultant lake levels with no further modification to lake shore processes.

Based on this, Boffa Miskell Landscape, 2023 considers that the ongoing operation of the Tekapo PS will have no adverse natural character effects or effects on significant sites in comparison to the status quo.

5.4.2 Hydrological Effects

As detailed in the Hydrology and Hydrogeology Assessment by PDP 2025, no changes to the hydrological operation of the Tekapo PS are proposed. As such, the hydrological and hydrogeological effects of the Tekapo PS will remain unchanged. In particular, the reconsenting and continued operation of the Tekapo PS will not result in alterations to any existing fluctuation patterns for hydrologically connected wetlands, or domestic water supply bores around Takapō.

5.4.3 Freshwater Ecology and Water Quality Effects

Cawthron 2025 identifies that the main effect of the Tekapo PS on Takapō is increased water level fluctuations, which reduces the extent of macrophytes in the literal zone. The littoral zone plays a disproportionately large role in supporting the ecology in low nutrient lakes such as Takapō, and the extent of the littoral zone is determined by the maximum depth that light can penetrate (the euphotic depth).

Prior to the construction of the Tekapo PS, the lake level fluctuated over a 2.6 m range (PDP, 2025), where it is estimated that 74% of the potential euphotic zone (the euphotic depth being 10.2 m) supported a stable and productive littoral ecosystem. The current operating range for Takapō leaves approximately 14% of the potential euphotic zone supporting a stable and productive littoral ecosystem.

However, the previously discussed reduction in glacial flour load has doubled the water clarity and increased the euphotic depth to > 20 m. A recent macrophyte survey showed that the maximum macrophyte depth has increased to 21.3 m (from 10.2 m prior to the construction of the Tekapo PS). The increase in euphotic depth means that there is now a stable productive littoral zone of around 12.5m that is not exposed by water level fluctuations. Considering the current water clarity of the Takapō as the baseline, the effect of the Tekapo PS through water level fluctuation, removes around 41% of the potential productive littoral zone. By comparison, 26% of the productive littoral zone was affected prior to scheme commissioning in the 1950s, and 88% was affected since the 1970s until the onset of the recent trend of reduced glacial silts.

Cawthron 2025 notes that it is difficult to determine the attribution of effects in this context. The assessment sets out that 41% of the potential littoral extent is affected by water level fluctuations, however, this is within the upper and lower extent of lake levels. On the other hand, the extent of littoral habitat below the variable zone is greater than it was historically. The annual range of water level fluctuations is not proposed to change with the current consent therefore there will be no change to the effects on Takapō.

Overall, Cawthron 2025 considers that it is unlikely that the construction and operation of the Tekapo PS has resulted in any appreciable changes to water quality within Takapō and concludes that the continued operation of the Tekapo PS will have no effects on the water quality and contributes to the naturally low productivity and restricted food supply for salmonids in Takapō.

Lakes McGregor (709.2 masl) and Alexandrina (711.9 masl) are within the Takapō catchment. Analysis by PDP 2025 showed that water levels in Lake Alexandrina are not influenced by the Tekapo PS; therefore, it has no effect on this lake. At times, the Tekapo PS can have minor effects on the water level on Lake McGregor, when Takapō is filled to its maximum operating level (710.9 masl). However, the minor effect on water levels is expected by Cawthron to have a negligible effect on the ecology of Lake McGregor.

5.4.4 Native Fish

Recent fish surveys in Lakes Takapō, Alexandrina and McGregor and Takapō tributaries have reported two native fish: common bully and kōaro, but longfin eels that have previously been reported were not detected.

Most common bullies reside in the lake where they can complete their whole life cycle. Individuals may also move upstream a short distance into lake tributaries, especially low gradient systems. Larval fish that hatch from eggs laid in the tributaries move downstream to Takapō. Larval common bullies that hatch from eggs laid in Takapō remain in the lake. The larval bullies are initially pelagic feeders and become more benthic in habit when they are 15-20 mm long. While the fish are pelagic there is potential for some of them to be entrained in the outflow and pass through the Tekapo A power station into the Tekapo Canal. There is some potential for larval fish mortality from pressure changes during passage through the turbines. However, the presence of a large common bully population in the Tekapo Canal indicates that survival has been sufficient to establish and possibly help maintain this large common bully population. The impact of any loss of larval fish from the lake on the lake and lake tributary populations of common bully are not expected to be evident.

Kōaro have adult populations in the lakes and larval kōaro occur as pelagic fish in the lakes. The larval kōaro become benthic and migrate to adult habitat in the tributaries or the lake bottom when about 50 mm long. While the fish are pelagic there is potential for them to be entrained in the outflow and pass through the Tekapo A power station into the Tekapo Canal. There is some potential for larval fish mortality from pressure changes during passage through the turbines. Research on larval kōaro behaviour in Lake Wakatipu (Augspurger 2017[139]) found that the pelagic larval kōaro did not disperse randomly around the lake. Rather they were concentrated in the inflow plumes of the lake tributaries. For Takapō this means that the pelagic kōaro are likely to be concentrated near the major inflows, the Cass and Godley Rivers, both of which have large adult kōaro populations and are distant to the scheme intake. It is expected given this behavioural trait that few larval kōaro will encounter the power scheme intake. The larval kōaro are also known to exhibit rheotaxic behaviour and resist moving downstream with the current and rather swim in an upstream direction. Therefore, they will actively resist being entrained in the scheme intake.

Furthermore, given the size of the lake by far the majority of the larval bullies and kōaro will never encounter the Tekapo intake. Also prior to the development of the hydro-electric scheme the natural lake outflow to the Takapō River would have entrained larval

[139] Augspurger JM 2017. Early life history of a landlocked amphidromous fish: migration, critical traits and ontogeny. Unpublished thesis, Department of Zoology, University of Otago.

bullies and kōaro in similar proportions as likely to occur today as the natural outflow is a similar size to the scheme intake inflow.

Adult longfin eels are the only native fish that would actively seek to move downstream into the intake as they undertake their migration to sea to spawn. However, the longfin eel survey conducted by Water Ways Consulting and NIWA in 2019 failed to catch any longfin eel in Lakes Takapō, Alexandrina and McGregor or their tributaries. Therefore, while entrainment and possible mortality can occur for longfin eels, as the longfin eel population has now fallen to below detection levels, actual out migration and any associated mortality is expected to be very low and will be declining further.

Any effect of the intake and power station passage on present native fish populations in Takapō is expected to be undetectable. The longfin eel population in the lake is too small for the scheme to have an effect. The effect on larval fish is expected to be very small because they can either survive turbine passage (bullies) or actively avoid entrainment in the intake (kōaro). Adult populations of common bully and kōaro occur upstream of the intake and are unaffected by any larval fish entrainment.

The effects of lake-level fluctuations on the littoral zone of Takapō are described in Section 2.8 of the Appendix L Aquatic Effects Assessment report. The changes in water clarity and increase in the depth at which macrophytes occur will benefit all types of fish present in the lake.

The main potential effect of lake level fluctuations is the stranding of fish or eggs when lake levels drop. Of the three native fish potentially present in Lakes Takapō, Alexandrina and McGregor (common bully, kōaro, and possibly longfin eels), the fish most exposed to lake level fluctuations is the common bully as the bully habitat includes, but is not limited to, the shallow lake margins. The bullies living around the lake margins are already exposed to lake level fluctuations and to substantial wave action driven shoreline disturbance. However, the presence of common bully catches in fyke nets set along or near the shoreline indicates that despite this disturbance common bullies survive in good numbers around Lakes Takapō, Alexandrina and McGregor. Under the current lake level regime, the bullies maintain a healthy population. The outflow from the lake into the Tekapo PS mimics the natural outflow and given the area of Lakes Takapō, Alexandrina and McGregor it is extremely unlikely that lake levels can fall fast enough to cause fish stranding. The risk of stranding is further mitigated by the nature of the lake shore, the shallow lake area and shoreline is sloped with little chance of forming isolated pools as the lake level falls. Therefore, stranding of bullies on the lake shore is considered to be a very low risk.

Common bully spawning sites with eggs, if laid very near the lake shore, may be at risk of being stranded by a lake level fall. Spawning near the lake shore is considered to be unlikely as the disturbance caused by wave action makes the shallow water habitat unsuitable for spawning. Also, the risk of egg stranding is already present due to the

present lake level fluctuations. Stranding of eggs is not considered a risk when the lake is falling after a flood event. It is extremely unlikely that bullies will spawn on the flooded lake shore as this will not have suitable spawning habitat and bullies will have insufficient time to select nest sites and for the males to undertake courtship behaviour to attract females to spawn. The potential impact of egg loss on the bully population is also further mitigated by the bully reproductive strategy. Female bullies can spawn multiple batches of eggs each year and if some are lost subsequent spawning activity can provide the common bully reproductive requirements.

Koaro, when present in the lake, are either pelagic larval fish residing in the water column or benthic adult fish that are expected to live in deeper water below the littoral zone. Neither of these life history stages is expected to be directly affected by lake level fluctuations.

If eels are present in the lake, they are unlikely to strand as large eels will remain in water deep enough to avoid stranding and small eels and elvers are likely to wriggle downslope and escape isolated pools rather than be stranded.

5.4.5 Shoreline Morphology

Shore Process 2022 details the effects of the Tekapo PS on the physical lake shore processes and geomorphological changes of Takapō. Extending the water level range of Takapō to approximately 3 m lower and 5 m higher than the range prior to the completion of the Tekapo PS has resulted in the development of a "new" shoreline. The initial change to the Takapō shore was relatively rapid and likely occurred within the first ten years after raising the maximum water level. Gradual change to the upper limit of the beach is ongoing but is associated with high or flood levels coincident with wind-wave events. Erosion, and retreat of backshore cliffs is an ongoing process related to the development of the shore to the modified water level range. It occurs at a slower and episodic rate in comparison to initial shore development. Cliff retreat is mainly evident where the backshore deposits are relatively erodible by subaerial processes and by wave run-up at high water levels, and where buffers of sediment protecting the base of the backshore slope after initial erosion has been removed.

In respect of future potential effects of the ongoing operation of the Tekapo PS, the likely effects on the Takapō physical shore processes are as follows:

1. Continued but episodic erosion of currently eroding cliffs;
2. Continued alongshore transport of sediment from fluvial source (rivers and streams) and backshore erosion;
3. Slow landward movement and elevation of barrier beaches, and

4. Continued inundation of low-lying land and river and stream mouths at high lake levels.

The following figures and table provide an overview of the anticipated areas of further shoreline development and change. Three types of shore development are indicative of accretional change (delta growth, spits, forelands and barrier beaches, and landward movement of the beach). Cliff and hillslope erosion are indicative of landward retreat of the shoreline and are of particular importance where erosion may affect resource use of the shore. Areas where inundation is likely to occur in the future are based on existing areas of inundation. Also indicated on the figures are two locations where there is existing shore protection through rock revetment structures.

Table 17 provides further detail on the potential future changes to lake shore morphology (with the site number in Table 17 corresponding to the numbers in the subsequent figures).

In summary, likely future effects on the physical shoreline processes on Takapō of continued operation of the Tekapo PS under the current operating regime are likely to be of the same character and order of magnitude as in the existing environment. In terms of climate change, the projected higher inflows in spring and autumn but lower inflows in summer may result in greater coincidence of high lake levels with strong equinox wind events from the northwest quarter. However, as the current lake level operating range was designed to largely avoid these types of conditions, there is unlikely to be any increase in erosion due to climate change related changes.

The effects of continued Tekapo PS operation will not change the physical shoreline processes from those presently existing and observed over the period that Genesis has owned and operated the scheme.

Table 17: Potential Changes in Lake Shore Morphology

Site	Shore Description	Potential Effect of the Tekapo PS
1	Low-lying, with large trees, picnic area and walking/cycling tracks	Regular inundation of land below 711 m, and occasional inundation of land between 711 to 712 m. No change to current character of area.
2	Gravel pits between shore and road	Potential for erosion due to groundwater flow from pit to shore. No change to current character of area.
3	Cliffs within ~50 m of road, gravel beach	Ongoing episodic erosion of cliff at slow rate. No hazard to the road. No change to current character of area.

Site	Shore Description	Potential Effect of the Tekapo PS
4	Cliffs within ~50 m of road, rock at base	Probably stable but winnowing of fine sediments from wave splash at high lake levels may lead to slope instability. No change to current character of area.
5	Fine gravel beach with willow trees near top of main operating range	Additional sediment to beach due to alongshore transport from the north. No change to current character of area.
6	Barrier beach with low, swampy area to landward	Slow landward movement of barrier, reduction in size of swampy area. Inundation of low-lying swamp area at high lake level. No change to current character of area.
7	Beach scattered with large rocks and backed by pine trees	Continued erosion of backshore at high lake levels, addition of gravels to beach and loss of fine sediments from the nearshore shelf. No change to current character of area.
8	Trees and scrub at low elevation, low-lying wide beach	No change to current character of area.
9	Rock hazards to boats	Boating hazard at higher levels when rocks are partially covered. No change to current character of area.
10	Road close to cliff edge but at high elevation	Ongoing episodic erosion of cliff at slow rate, offset by sediment contribution to the beach from Boundary Stream and adjacent streams. Possible long-term hazard to Lilybank Road. No change to current character of the area.
11	Steep hillslope near stream mouth	Ongoing episodic erosion of cliff at slow rate, offset by sediment contribution to the beach from Boundary Stream and adjacent streams. No change to current character of the area.
12	Perched barrier beach and low-lying hinterland	Slow landward movement and increased height of barrier beach. Occasional inundation of hinterland. No change to current character of the area.
13	Active cliff erosion, with cliffs >5 m high	Ongoing episodic erosion of cliff at slow rate. Occasional re-activation of cliff erosion where presently stable. Supply of sediment to alongshore transport. No change to current character of the area.
14	River fan and low-lying delta	Continued deposition of sediment at stream/river mouth, growth of delta/fan and supply of sediment for alongshore transport by waves. No change to current character of the area.
15	Richmond Station – rock structure lakeward of farm	Potential for wave run-up to small building (“Folly”). Ongoing potential for erosion around base of revetment.

Site	Shore Description	Potential Effect of the Tekapo PS
	building; “Folly” near top of operating range	No change to current character of the area.
16	Road on steep hillslope with numerous slips; fractured rock basement and hard, rock cliff	Ongoing hillslope erosion, gullying and slumping. Potential earthquake landslip hazard to road and impulse wave generation in Takapō. Ongoing slow removal of sediment at base of active slips. No change to current character of the area.
17	Hillslope failure undercut by lacustrine processes	Ongoing hillslope erosion, gullying and slumping. Potential earthquake landslip hazard to road and impulse wave generation in Takapō. Ongoing removal of sediment at base of active slips during southerly wave conditions and potential hazard to Godley Peaks Road. Continued delta accumulation from the Godley River. No change to current character of the area.
18	Rapawai Lagoon behind low barrier beach ridge	Slow landward movement of barrier beach. Occasional flooding of lagoon. No change to current character of the area.
19	Low-lying farmland	Beach at elevation nearly equal to elevation of lower slopes of farmland. No change to current character of the area.
20	Pierces Pond situated behind low barrier beach	Slow increase in barrier beach height and width due to continued sediment supply from the shore to the north. No change to current character of the area.
21	Shoaling gravel and sand deposits at about 706 masl elevation	Area will continue to shoal due to alongshore transport of sediment from the north, with an increase in the elevation of shoal surface. Medium to long-term hazard to boating. No change to current character of the area.
22	Gravel beach at base of stable cliff – concrete bunker at limit of wave run-up	Continued beach development due to alongshore sediment transport from south and north. Occasional inundation of old building in flood events (over 711 masl). No change to current character of the area.
23	New houses on terrace above active beach 725 masl terrace elevation, with access road on lower terrace 718 masl elevation	Continued beach development due to alongshore sediment transport from south and north. No change to current character of the area.
24	Gravel beach at base of stable cliff and house on high terrace 720 – 725 masl elevation	Continued beach development due to alongshore sediment transport from south and north. Possible increase in elevation of top of beach with foreland accumulation of sediment. No change to current character of the area.

Site	Shore Description	Potential Effect of the Tekapo PS
25	Low-lying channel mouth from Lake McGregor with willow trees on banks	Continued occasional inundation of low-lying channel. Growth of beach due to accumulation of sediment from alongshore transport, and landward movement of the barrier beach. Possible enhancement of existing processes of change due to sediment pulses arriving at this section of shore.
26	Low-lying flat area with mobile barrier beach fed by gravels from south and north	Continued mobility of barrier beach gravels and growth of tombolo landforms joining high lake level shore to outlying high paleo-ridge lines. Continued slow movement of barrier beach towards Godley Peaks Road. Potential for occasional inundation of informal camping area lakeward of Godley Peaks Road. Ongoing boating hazard by extended area of shoaling around islands at high lake levels. Possible enhancement of existing processes of change due to sediment pulses arriving at this section of shore.
27	Rock outcrops along eroding cliffs in Mt John Formation gravels and base rock, with stream channels to lake	Mainly stable shoreline, with some alongshore transport of gravels from north to south. No change to current character of the area.
28	Very fractured and erodible rock cliff	Continued slow episodic erosion of the cliff backshore with periods of stability when the base of the cliff is protected from waves by accumulations of beach sediments. No change to current character of the area.
29	Mt John Observatory walkway within 10 m of cliff edge	Continued episodic erosion of cliff. Threat to walkway stability and short to medium-term to users of the walkway due to close proximity of cliff. No change to current character of the area.
30	Northern end of 4WD track along southwestern shore	Ongoing episodic erosion and inundation of low-lying land at the end of track. Areas of sediment accumulations due to alongshore sediment transport from the north. No change to current character of the area.
31	Low-lying swampy area lakeward of car park	Regular inundation of land below 711 m, and occasional inundation of land between 711 to 712 m. No change to current character of area.
32	Boat ramp on gravel beach	Ongoing intermittent sediment movement across ramp requiring maintenance removal for boat launching. No change to current character of area.
33	Tekapo Intake Structure and revetment along length of shore	Placed rock revetment structure with mobile gravels along lakeward edge. No change to current character of area. Ongoing maintenance of structure at base and ends due to undermining by abrasion and loss of fine sediments, and end

Site	Shore Description	Potential Effect of the Tekapo PS
		effect on the structure of waves at lake levels above 709 masl respectively.
34	Large rocks on upper foreshore below the developed hinterland	Stable shore, subject to inundation at high operating range. No change to current character of area.
35	Beach ridges at limit of old high-water events 712 masl elevation	Beach ridge deposits in the backshore that indicate the limit of high lake level events and extreme wave processes. No change to current character of area.

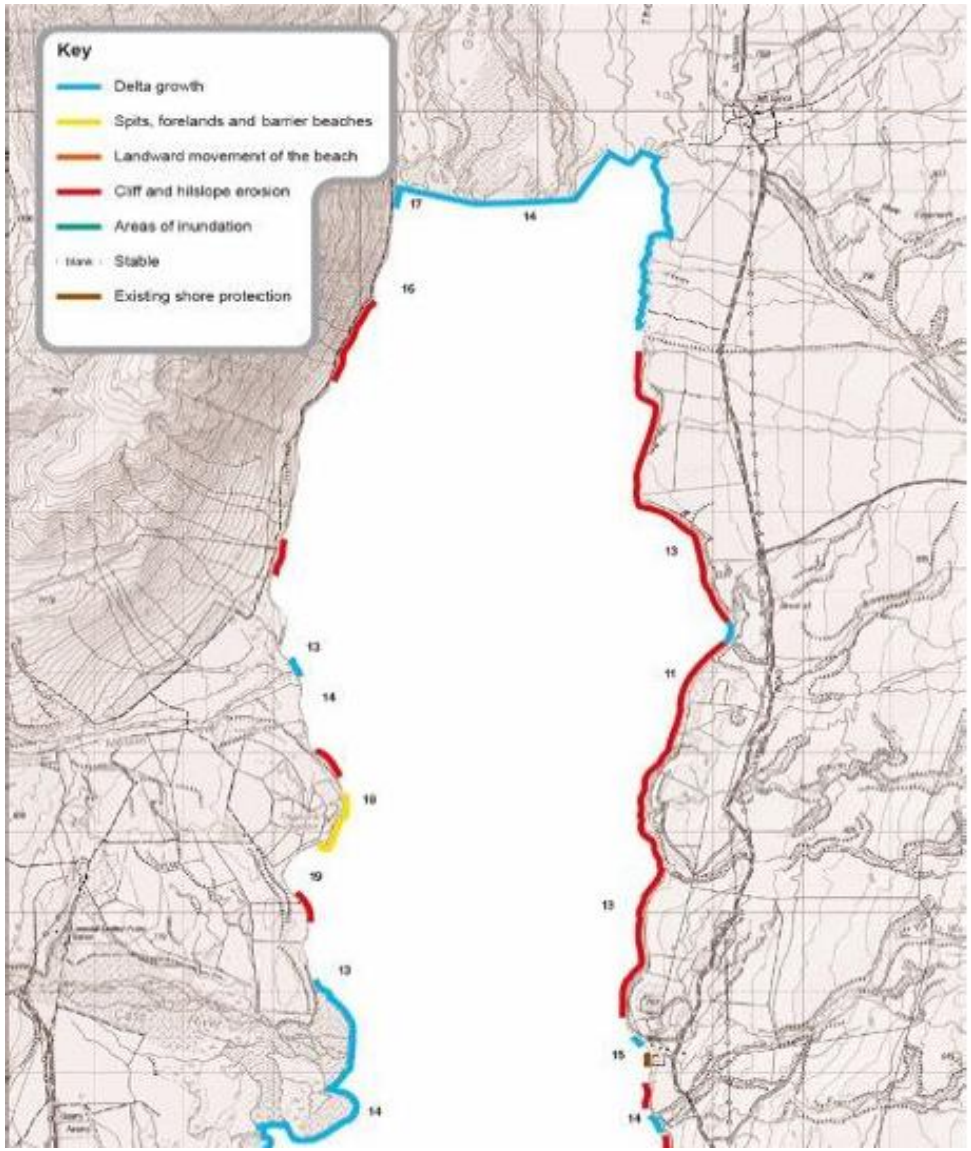

Figure 35: Potential Changes in Lake Shore Morphology (Northern Section)

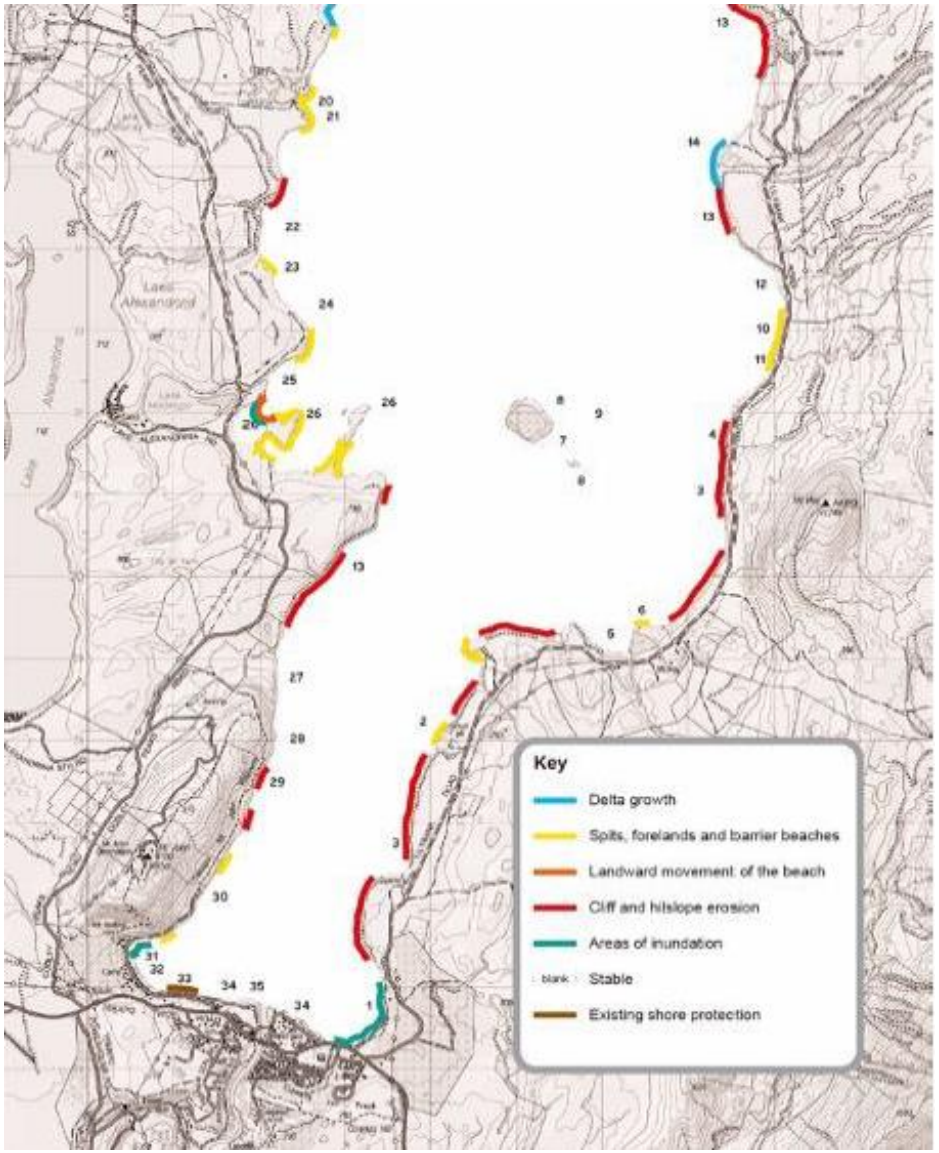

Figure 36: Potential Changes in Lake Shore Morphology (Southern Section)

5.5 TEKAPO CANAL

5.5.1 Natural Character

The Tekapo Canal is entirely man-made for the purpose of conveying water associated with the operation of the Tekapo PS. In that regard, Boffa Miskell Landscape, 2023 considers that the natural character of the canal is very low. That said, the Tekapo Canal now forms an integral part of the existing environment and contributes to the environment people experience when travelling in the area.

5.5.2 Hydrological Effects

As detailed in the Hydrology and Hydrogeology Assessment by PDP 2025, the hydrological operation of the Tekapo PS will remain unchanged. As such, the hydrological and hydrogeological effects of the Tekapo PS in respect of the Tekapo Canal will remain unchanged.

5.5.3 Freshwater Ecology and Water Quality Effects

Overall, based on their assessments Cawthron 2025 conclude that the Tekapo Canal provides a productive environment for macroinvertebrates and salmonid fish supporting a popular fishery, and the ongoing operation of the Tekapo PS will not affect the canal's ecology and fishery.

5.6 TAKAPŌ RIVER

5.6.1 Natural Character Effects

As detailed in Boffa Miskell Landscape, 2023, the degree and modification of the flow regime within a river channel is one factor that is considered to contribute to peoples experience of the naturalness of river environments, as well as how this affects other aspects of natural character including its abiotic and biotic attributes. As the Takapō River often has no / minor groundwater levels of flow for the first 7 km, due to upstream water diversion by the Tekapo PS, this highly modified natural flow regime has resulted in a visible reduction in natural character of the Takapō River along this particular reach of the river. Beyond the Fork Stream confluence to its mouth at Lake Benmore, the Takapō River maintains a small, but permanent flow, lifting the levels of natural character to a moderate degree. It is noted that the Tekapo PS has an effect on the flow for the whole river.

The natural character of the Takapō River will remain at its existing level, as Genesis is not proposing any changes to the diversions associated with the Tekapo PS. This means that there will be an absence of flows at times in the river for the first 7 km and a lower flow for the remaining parts of the river. While this represents a major modification compared to the natural flow regime, Boffa Miskell Landscape, 2023 considers that there

will be no additional adverse effects compared of the ongoing operation of the Tekapo PS due to the already highly modified current flow regime.

Boffa Miskell Landscape, 2023 concludes that a consistent minimum flow would enhance natural character (and landscape and amenity values) of the Takapō River, most notably in its upper reaches between the Tekapo control gate and Fork Stream.

However, the extent of the minimum flow that would be required in order to provide any material enhancement of natural character is difficult to identify and, as discussed earlier in this assessment, would have significant implications for the level of electricity generation possible from the WPS.

5.6.2 Hydrological Effects

As detailed in the Hydrology and Hydrogeology Assessment by PDP 2025, Genesis is not proposing modifications to the hydrological operation of the Tekapo PS. As such, the hydrological and hydrogeological effects of the Tekapo PS will remain unchanged from those currently forming part of the existing environment.

5.6.3 Freshwater Ecology and Water Quality Effects

As detailed in Cawthron 2025 and Water Ways 2025, the construction of the infrastructure associated with the Tekapo PS and the diversion of water from Takapō through the Tekapo Canal has resulted in significant changes to the Takapō River, which can be summarised as follows:

1. Change in riverine habitat in the Takapō River with the reduced flows altering habitat availability leading to changes in the fish community and/or abundance;
2. Impedance of fish passage from the Takapō River to Takapō;
3. Reduction in habitat quality in the Takapō River due to lack of flushing flows;
4. Very limited surface flows in the Takapō River above the Fork Stream confluence;
5. High water clarity associated with the diversion of glacial flour from Takapō;
6. A stable flow regime conducive to high production of periphyton and macroinvertebrates and successful salmonid spawning; and
7. Physical habitat (depths, velocities and substrate) downstream of the Grays River confluence that are highly suitable for trout food production and trout spawning.

In addition, there is the potential for the Tekapo PS to have positive effects, including:

1. The flow reduction in the Takapō River provides more suitable habitat for native fish species that prefer low water velocities and shallow water habitats. This includes the bully and galaxiid species present in the Takapō River;

2. The flow reduction in the Takapō River upstream of the Mary Burn and Grays River confluences may limit the presence of large salmonids and correspondingly provide more suitable habitat for native fish species; and

3. A reduction in flood disturbance thereby a reduction in flood related mortality.

CRC also actively manages the Takapō River as part of flood protection works involving the use of machinery to grade the riverbed and in some locations exotic species such as willow have been planted to stabilise the river. Such activities alter the habitat available for specialist braided river birds.

The Takapō River was invaded by didymo in 2007, which has further altered the river. Didymo commonly reaches nuisance levels in natural lake-fed rivers. The stable flow regimes, immobile substrate, and low sediment supply of such rivers allow didymo to accrue with little bed disturbance and sandblasting. Consequently, Cawthron 2025 considers that didymo would likely flourish in the Takapō River, even if it were flowing naturally in the absence of the Tekapo PS.

Lake-fed rivers, such as the Takapō River would have been in its natural state, are more hydraulically stable than rain-fed rivers (Jowett and Duncan, 1990[140]). Similarly, the settling of sediment in upstream lakes means that sediment supply to lake-fed rivers is very low, which in turn means that large amounts of mobile sediment are not continually moving downriver. The relatively high level of flow and bed stability of lake-fed rivers contributes to their unique characteristics but also provides perfect conditions for didymo and other algae. Didymo is abundant in lake-outlet rivers, including ones that retain a natural unregulated outlet (e.g., Clutha River / Mata-Au, Hurunui River). This is the case regardless of river size or flow since it is flow variability and associated bed mobilisation, rather than flow itself, that seems most important for controlling didymo (Cullis et al. 2015[141]). If all the natural flow was allowed down the Takapō River, it is very likely that there would still be abundant didymo blooms that would affect macroinvertebrate communities and other aquatic life.

Flushing of algae and didymo from the Takapō River would likely have only a temporary and uncertain effect. As discussed in Section 4.3 of the Appendix L Aquatic Effects Assessment report, the magnitude of flood, relative to base flow, required to dislodge periphyton and didymo mats varies between rivers but is typically between 1.5 and 10 times the median flow (Kilroy et al. 2017). Smaller freshes are effective at removing didymo mats only in rare situations where there is sufficient sand within the riverbed to

[140] Jowett IG, Duncan MJ. 1990. Flow variability in New Zealand rivers and its relationship to in-stream habitat and biota. New Zealand Journal of Marine & Freshwater Research. 24:305–317.

[141] Cullis J, McKnight D, Spaulding S. 2015. Hydrodynamic control of benthic mats of *Didymosphenia geminata* at the reach scale. Canadian Journal of Fisheries and Aquatic Sciences. 72(6):1–13.

enable a 'sand-blasting' effect (Biggs 2000[142]). In general, bed mobilisation is required to dislodge didymo mats (Cullis et al. 2015). The Takapō River has relatively coarse substrates and wide channels, meaning relatively large floods will be required to mobilise the bed. Based on these broad geomorphological principles, it is anticipated that a flow of between 6 and 10 times the median flow would be required to cause periphyton and didymo scouring. If all the natural flow was allowed down the Takapō River, it is very likely that there would still be abundant didymo blooms that would affect macroinvertebrate communities and other aquatic life and the effectiveness of flushing flows on improving macroinvertebrate communities is probably limited.

There is likely to be a complex interaction between didymo and other periphyton species in different parts of the Takapō River, with contrasting patterns of algal dominance in different reaches along the river during observed during the Cawthron studies reported in Appendix L. Temporal variations in periphyton dominance do occur as indicated by the Environment Canterbury periphyton monitoring data, likely representing variability over time rather than any specific trend.

A review of the Environment Canterbury periphyton data for the Takapō River Steel bridge site shows variability in periphyton biomass (chlorophyll a) over time and variable amounts of benthic cyanobacteria and didymo over time but no overall trend to a more mixed periphyton community.

Notwithstanding this, the Takapō River has good water quality and a stable flow regime that supports a productive ecosystem (abundant periphyton and invertebrates), habitat for six species of native fish, habitat for brown trout, rainbow trout and sockeye salmon, that in turn support a relatively popular trout fishery. The overall effects of the existing operation of the Tekapo PS on the Takapō River are challenging to assess given the invasion of didymo—the stable flowing clear water habitat enhances macroinvertebrate and trout production while also promoting didymo which simultaneously reduces them. The generally positive effects of the Tekapo PS scheme on the salmonid fishery in the Takapō River have been reduced by the introduction of didymo. However, the river still supports important values and continuing operation of the Tekapo PS will not change the existing values.

Cawthron 2025 concludes that the Tekapo PS has minor adverse effects, as well as minor positive effects, on water quality and aquatic ecology within the Takapō River.

In respect of native fish, Water Ways 2025 sets out that, overall, the Takapō River supports the expected range of native fish, given the context of effects within the Waitaki catchment that influences the distribution and abundance of the native fish. In addition,

[142] Biggs BJF. 2000. New Zealand periphyton guideline: detecting, monitoring and managing enrichment of streams. Wellington: Ministry for the Environment.

common bully and kōaro are both more abundant in the catchment than they are expected to have been in the catchment in its pre-development state.

In terms of direct negative effects on native fish, the flow reduction in the Takapō River created by the Tekapo PS has reduced the available habitat for some species, e.g., longfin eel, but other factors rather than habitat are limiting their populations. For the threatened native galaxiids the present-day distribution indicates that the pre-development Takapō River was unlikely to have supported populations of these fish and scheme is unlikely to have any effect on their abundance.

5.7 LAKE PŪKAKI

5.7.1 Freshwater Ecology and Water Quality Effects

Cawthron 2025 provides a brief assessment of the water quality and ecology impact of the Tekapo PS on Lake Pūkaki, stating that the quality of water that is discharged from the Tekapo Canal into Lake Pūkaki is generally excellent and therefore adverse effects of the Tekapo PS on the ecology of Lake Pūkaki are less than minor.

This assessment is based on a comparison of water quality in Lake Pūkaki and Takapō, the latter being the source of the water discharged from the Tekapo Canal into Lake Pūkaki. The water quality is good in both lakes and the Trophic Level Index for both lakes is similar.

Cawthron assumed no major change in water quality as it transits through Tekapo Canal. A summary of monthly water quality monitoring data for the Tekapo B penstocks stilling pond (i.e. the downstream end of the Tekapo Canal) over the period January 2020 to September 2023 (data supplied by Mount Cook Alpine Salmon) as shown in Table 18 supports the conclusion that the quality of the discharge water exiting the Tekapo B power station is generally excellent and complies with the limits set out in the Canterbury Land and Water Regional Plan (CLWRP).

Table 18: Summary of monthly water quality data collected by Mount Cook Alpine Salmon (January 2020 – September 2023).

Unit	Total ammoniacal-N (g/m^3)	Total nitrogen (g/m^3)	Total phosphorus (g/m^3)	Chlorophyll-*a* (g/m^3)
Count	47	20	44	32
Mean	0.013	0.078	0.005	0.009
Median	0.010	0.066	0.004	0.0007

Unit	Total ammoniacal-N (g/m^3)	Total nitrogen (g/m^3)	Total phosphorus (g/m^3)	Chlorophyll-*a* (g/m^3)
Standard dev.	0.011	0.034	0.005	0.044
Maximum	0.053	0.178	0.030	0.250
NOF classification*	A	A	A	A

* National Objectives Framework classification from the National Policy Statement for Freshwater Management 2020.

5.8 LAKE BENMORE

Cawthron 2025 sets out an assessment of the effects of the Tekapo PS on Lake Benmore, being a receiving environment for flow releases from the scheme along the Takapō River (which discharges into Lake Benmore). The assessment sets out that flow releases part the Lake George Scott Weir are occasionally of a size such that didymo and other periphyton mats can be scoured from the Takapō River.

Cawthron looked at the effect of periphyton sloughed from Takapō River, with the results indicating that the effect of periphyton deposition on dissolved oxygen in the Haldon Arm of Lake Benmore will be minor (< 0.5 mg/L and more likely in the range of 0.03–0.1 mg/L). There are many factors potentially affecting lake dissolved oxygen, including uptake associated with decomposition of phytoplankton from near the surface dropping down through the water column and other normal lake ecosystem processes, many related to nutrient inputs and phytoplankton blooms in the lake, rather than sloughing of didymo and other periphyton from the Takapō River. All of this is unrelated to the operation of the Tekapo PS.

The deposition and decomposition of transported periphyton mats in the hypolimnion of the Haldon Arm of Lake Benmore represents a potential risk to bottom water oxygen concentrations within the lake. However, Cawthron undertook a mass balance assessment using worst case scenario estimates of biomass and decomposition rate, demonstrating that this potential risk is less than minor in nature and unrelated to Tekapo PS operation. This assessment, coupled with the Cawthron assessment of monitored water quality parameters, indicates that the Tekapo PS has no adverse effects on Lake Benmore.

5.9 FISH PASSAGE

Water Ways 2025 provides an assessment of the effects of the Tekapo PS on fish passage, which is summarised, as follows:

1. Migratory fish are largely absent from the Takapō River, which is due to the barriers further downstream on the Waitaki River blocking fish passage for migrant species capable of long inland migrations. This lack of migratory fish is not an effect of the Tekapo PS. However, the Tekapo PS will prevent fish passage from the Takapō River to Takapō and back downstream. If longfin eel transfers occur to Takapō and upstream areas, downstream passage or transfer for adult migrant eels would need to be provided;

2. The pre-existing stock of longfin eels in the Takapō River catchment is unknown. However, local residents recall large eels being common or abundant 30-40 years ago in the Takapō River tributaries such as the Grays River. It is unlikely the eels were abundant in the Takapō River if it had an open braided gravel riverbed as this does not provide good cover for large longfin eels unless there are logjams, macrophyte beds and stable side braids to reside in;

3. Kōaro resident in Takapō can conduct their natural migration to and from the lake and its upstream tributaries. However, larval kōaro in the Takapō River migrate downstream to Lake Benmore. Lake Benmore has provided new rearing habitat for the pelagic kōaro larvae, and the adult population is expected to be increasing in the Tekapo catchment downstream of Takapō; and

4. Landlocked populations of common bully are present in all the upper Waitaki Lakes including Takapō. The populations are abundant and the distributions of adult common bullies in the lower reaches of lake tributaries is also normal. The presence of large numbers of common bully in the Tekapo Canal also indicate the bully has benefited from the construction of the canal.

In respect of fish passage at the Tekapo Canal culverts:

a. The Mary Burn, Irishman's Creek and Fork Stream are the major streams that flow under the Tekapo Canal. All three streams flow through culverts and these have the potential to be fish passage barriers;

b. The Mary Burn culvert has records of upland bully and Canterbury galaxias upstream of the culvert in recent years. The culvert is likely to prevent salmonid passage which would protecting native fish communities upstream of the Tekapo Canal;

c. At Irishman's Creek there is no evidence that the culvert is a fish passage barrier with fish survey data upstream of the culvert showing all species are passing through the culvert; and

d. Fork Stream culvert has a downstream concrete apron with an approximately 1 m fall that will impede fish passage. A small fish ladder was constructed to assist trout passage over the concrete apron; however, a trout barrier was subsequently installed to protect threatened galaxiids. Kōaro and elvers can still ascend the 1 m fall as these small fish can both climb the vertical face of the concrete apron and also still use the fish ladder as a small flow suitable for their passage still flows down the fish ladder. Other native fish such as upland bully and Canterbury galaxias will struggle to gain upstream fish passage at this culvert. However, neither species needs to migrate upstream and there are resident populations of both species upstream of the culvert. The present restriction on salmonid passage by this culvert is beneficial to native fish in the upper reaches of Fork Stream as it may be limiting salmonid abundance and reducing predation. Therefore, the present limitation of fish passage at Fork Stream is most likely either neutral or a benefit to native fish in Fork Stream.

5.10 GROUNDWATER EFFECTS

As detailed in the Hydrology and Hydrogeology Assessment by PDP, the hydrological operation of the Tekapo PS will remain unchanged. As such, no changes in the groundwater level fluctuations currently experienced will occur as a result of the ongoing operation of the Tekapo PS and the effects of the Tekapo PS on groundwater will remain unchanged.

5.11 TERRESTRIAL ECOLOGY EFFECTS

5.11.1 Terrestrial Invertebrates

Entecol 2025 undertook an assessment of the impact of the Tekapo PS on braided river invertebrates. In doing so, Entecol identifies that Tekapo A was commissioned 70 years ago and the Tekapo Canal and Tekapo B more than 40 years ago, so controlled water flows have been in place for several decades. Invertebrates typically have much shorter generation times than vertebrates, and invertebrate communities respond to perturbations quite rapidly, so the most significant changes in invertebrate communities due to the effects of reduced flows will already have occurred.

The impacts of both predators and weeds are exacerbated by the modification to flow regimes in the Takapō River as a result of the Tekapo PS, however Entecol notes that both weeds and predators would still pose a threat to terrestrial invertebrates in the Takapō River even if the Tekapo PS was not operating. However, the reduced frequency and severity of flooding allows increased opportunity for weed growth and vegetation

stability over the affected reach of the Takapō River, and this has potential to affect the community structure of those habitats over the long-term, unless managed.

In contrast to this, and as noted for several species (in particular, grasshoppers and weta), the reduced severity of natural flood events can also have a potentially positive effect for some of the species that benefit from a more stable habitat.

Taking the potential for both negative and positive effects into account and given the known distribution of the species of conservation interest in the wider Mackenzie Basin, Entecol 2025 concludes that that the ongoing operation of the Tekapo PS is largely neutral, to minor adverse, in terms of its impact on the terrestrial invertebrate values of braided river habitats.

5.11.2 Herpetofauna

RMA Ecology 2023 sets out that adverse effects may potentially occur due to the ongoing operation of the Tekapo PS in relation to river flows. Mortality of Southern Alps gecko may result if releases of flows into the upper Takapō River result in swiftly rising waters that inundate lizards that have moved into vacant riverbed habitat. This contrasts with the lake margin areas, where periodic inundation would be a more gradual process, and would allow animals to retreat to higher ground.

Southern Alps gecko and McCann's skink are listed as 'Not Threatened' in the DoC threat classification. The population of both species are locally very large. Any potential loss of Southern Alps gecko and McCann's skink through operations of the Tekapo PS, would constitute a very small portion of the overall populations in the local area.

The level of potential effects in terms of loss of ecology values is assessed as 'Very low'. This 'Very low' level of ecological effect is equivalent to 'no more than minor' when considered in the context of potential effects on the environment under the RMA. Where the level of effects is anticipated to be 'Very low', the EIANZ guidelines recommend that normal design, construction and operational care should be exercised to minimise adverse effects.

Project River Recovery is a key programme that has resulted in beneficial outcomes for native lizards, through its focus on weed control and nesting bird protection across very large areas of the upper Waitaki Basin. RMA Ecology Ltd considers that the likely benefits of the work undertaken by Project River Recovery for controlling lizard predators over a large scale, and the potential conservation benefits on threatened as well as less rare lizard species in those areas, is likely to provide a conservation benefit that greatly exceeds the no more than minor level of adverse effects that may be caused by the re-consenting of the Tekapo PS scheme on native lizards.

5.11.3 Avifauna

Boffa Miskell[143] was engaged to undertake an assessment of effects on avifauna associated with the Tekapo PS. To provide an assessment of environmental effects of the Tekapo PS on avifauna, information was gathered on the ecological values (habitat and species) present at the Tekapo PS sites and within the wider area through a combined desktop and field approach. The assessment also considers the positive effects that Project River Recovery has had on avifauna in the catchments upstream of the Tekapo PS.

The BlueGreen avifauna report (BlueGreen Avifauna, 2025) concludes:

1. The inter-relationship of a number of ecosystem factors potentially affecting freshwater birds as a result of the Tekapo PS are complex and extremely difficult to separate. There are other variables, not associated with the Tekapo PS, both within and beyond the Tekapo catchment that have the potential to impact on the freshwater birds that are present;

2. The current freshwater species richness in the Takapō and surrounding habitats was found to be relatively similar to that recorded 15-20 years after the commissioning of Tekapo A, with a total of 21 species recorded;

3. In terms of the specialist river-bird species, the data indicates that the abundance of several Threatened or At-Risk species (banded dotterel, black-fronted tern, NZ pied oystercatcher and wrybill) has significantly decreased in the Takapō River since 1991 (that being the time from which data has been collected for Project River Recovery);

4. While no data is available regarding river bird populations prior to the construction of the Tekapo PS, it is likely that the loss of braided river habitat in the Takapō River associated with the commissioning of Tekapo A (1951) and Tekapo B (1977) power stations would have resulted in a decline in the specialist river bird species. However, it is not possible to definitively attribute the cause(s) of the apparent ongoing decline of these species on the Takapō River post-1991;

5. Further analysis of the specialist river birds showed a general increase in abundance above the combined WPS (including the Tekapo PS) most likely due to the Project River Recovery measures and decrease below. Notably, significant increases in abundance of NZ pied oystercatcher and banded dotterel recorded

[143] The assessment was initially prepared by Dr L Bull while employed by Boffa Miskell Limited. Dr Bull is now a Senior Ecologist / Director at BlueGreen Ecology Ltd and has updated the report for inclusion with this application.

in catchments above the combined WPS where Project River Recovery management is occurring, are contrary to the national population trends;

6. Conversely, a decreasing trend in abundance of wrybill was reported in five catchments, including three above the combined WPS. These decreasing trends in abundance are contrary to the national population trend recently reported for this species. The detection of instances of significant decreases in species abundance above the Tekapo PS indicate that additional pressures beyond the power scheme are threatening several populations. Based on the BlueGreen Ecology avifauna results, it appears that the Ahuriri catchment (in which significant decreases in abundances were recorded for banded dotterel, NZ pied oystercatcher and wrybill) would benefit from conservation measures; and

7. Finally, the assessment recommends additional measures to be investigated that would further assist with the conservation efforts for wrybill in the Waitaki catchments. Furthermore, the detection of instances of significant decreases in abundance above the Tekapo PS indicate that additional pressures beyond the combined WPS are threatening several populations, particularly in the Ahuriri. As such, conservation measures should be investigated with DoC for the Ahuriri catchment. As detailed earlier in this AEE, Genesis is proposing the continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment.

The release of water into the Takapō River during bird breeding seasons may affect breeding river birds within the Takapō River. The effect is dependent on several factors, including lake inflows, lake levels and consent conditions (such as requiring recreational releases and maintaining lake levels specified in the Waitaki Water Allocation Plan). These releases define the existing environment which the consents sought should be assessed against. In that regard, the existing environment comprises a normally dry riverbed that is intermittently inundated with water from Takapō. The resource consents sought by Genesis will not change the existing situation whereby the normally dry riverbed that is intermittently inundated with water from Takapō.

Whether intermittent flows from Takapō will affect breeding river birds in the Takapō River is dependent on a number of factors, including:

- Exactly where the birds are breeding along the riverbed;
- The stage of the breeding season (e.g., pair bonding, egg incubation, chick mobility); and
- The volume and rate of water released.

Thus, if birds were nesting in an area where the water levels reached the nest then it may be affected. However, if birds were nesting in a location above the water level, then the nest and birds would be less likely to be affected.

Flows in the Takapō River flows upstream of Lake George Scott arise from:

1. Operational "top up" flows of approximately 10 cumecs for 1 hour every 2 days, so nesting birds are unlikely to establish within these flow areas.

2. Up to 30 recreational releases annually of approximately 16 cumecs, typically within the period October to April, meaning that the areas wetted by these flows are unlikely to be conducive to establishment of nesting birds.

3. Islanding Tekapo A on occasion (both planned and unplanned) due to Transpower requirements and Tekapo A maintenance / upgrade requirements can result in flows up to 130 cumecs.

4. Gate testing requirements (for dam safety purposes), including monthly flows of up to approximately 20 cumecs for 10 minutes dependant on lake level, annually opening each gate individually to a flow of up to approximately 20 cumecs (depending on lake level) for 10 minutes, being approximately 1 hour of tests over a 3 day period, and a five-yearly flow where each gate is opened to a flow of up to approximately 20 cumecs (depending on lake level) for 10 minutes, being approximately 1 hour of tests over a week.

Flows in the Takapō River below Lake George Scott only occur during flood events or on very rare occasions when the Tekapo Canal or Tekapo B station are not available to convey water.

In the absence of the Tekapo PS there would be changes in the flow of the Takapō River as well as changes to the river flow path occurring naturally that would affect bird habitat. Habitat that is presently available in the normally dry riverbed would not have been available in the absence of the Tekapo PS. The Tekapo PS assists with attenuating flood flows in the catchment which might otherwise affect the banks and bed of the river. It is noted that flow releases to the Takapō River would be managed in the same manner as has occurred under the present operating regime.

These flow releases described above are either provided for under the consent conditions (such as recreational releases or gate testing releases) or are unavoidable because of the requirement to manage lake levels in response to lake inflow rates. Changes in water levels in the Takapō River arising from the frequent operational and management releases through the upper Takapō River currently make this stretch of river not conducive to nesting river birds. While birds may establish nest sites downstream of Lake George Scott, flows into the lower Takapō River over the Lake

George Scott weir result from inflow-driven lake level management so can occur at any time.

5.11.4 Vegetation

The Ecological Solutions 2023 report provides an assessment of the existing ecological context within which the Tekapo PS operates and how the continued operation of the scheme affects the ecology values currently present, which is summarised below.

Since the Tekapo A Power Station was commissioned in 1951 and Tekapo B in 1977, the vegetation communities around the Tekapo PS have developed under a regime of managed water levels in Takapō and managed flows in the Takapō River. In combination with other external pressures (e.g., farming, flood protection works, planting by the former Catchment Board and more recently the regional council, pest browsing pressure and invasive species colonisation) this has resulted in generally low-quality lake edge vegetation, low quality braided river vegetation and typically moderate quality wetland vegetation. The vegetation recorded reflects the management regime and is not expected to be affected to any more than a low level by continued operation under the same control levels. In summary, the overall magnitude of local (ecological district) effects on the three specific vegetation types identified is set out in Table 19.

Table 19: Vegetation Effects

Habitat	Ecological Value	Level of effect	Overall magnitude of effect
Wetlands	High – Very high	Negligible	Low – Very low
Braided River vegetation in the Takapō River	Low – Moderate	Negligible	Very low
Lake edge vegetation	Low – High	Negligible	Very low

Lakeshore vegetation

The lake edge vegetation varies in quality from low (sparse, predominantly exotic e.g., exotic herbs growing between cobble and boulders) to moderate (includes more native species, representative and demonstrates ecological gradients e.g., matagouri shrubland or some turf vegetation). The majority of the lake edge comprises vegetation of low ecological quality and low to moderate ecological value.

At present the lake level variations are such that the extent of cobble and gravels is maintained and areas suitable for the development of turf vegetation are limited. Where

turf vegetation does occur, there is limited opportunity for natural zonation to woodier indigenous vegetation typical of natural lake edges to occur because of other adjoining land uses. Development of matagouri shrubland is limited to the upper margins (above the boulder and cobble zones and above the highest water level. Some of the river flats at the head of the lake and various areas around the shoreline such as at Lake McGregor and near Tekapo township have developed turf vegetation of moderate or better ecological quality since commissioning of the Tekapo PS, but their ecological value is limited by the high proportion of exotic species.

Given the same operating parameters, the low to high value habitats described above are expected to persist in much the same proportions and at the same locations to where they currently occur.

Wetland vegetation

The average wetland condition is indicative of comparatively good quality wetlands with a low degree of modification and low – medium external modification pressures. The wetlands are typically of high – very high ecological value.

Amongst other ecological drivers, the distribution and occurrence of wetlands in the landscape varies with the size, depth and connectivity of the wetland(s) to other hydrological systems. Overall, a reduction in water input usually results in a decrease in floristic diversity and an increase in exotic dryland vegetation, whereas an increase in water input can increase the size of the wetted area, increase the extent and depth of open water and bring about an increase in the abundance and diversity of aquatic vegetation.

There is no historic vegetation data for any of the wetlands in the vicinity of the Tekapo PS against which current vegetation can be compared, however any wetlands which are hydraulically connected to Takapō or other parts of the Tekapo PS (such as the canal) have developed or persisted over time under the hydrological regime imposed by the scheme.

On the basis that Genesis propose no change to the current operating regime, the risk of ecological change in these wetlands would be low except perhaps in infrequent events when the lake levels either exceed the maximum operating levels (due to natural rainfall or snow melt) or fall below the minimum operating levels (because of drought conditions) for a substantial amount of time. Other natural water inputs such as rainfall and snow melt are expected to alter with climate change, but those effects would be mitigated to some degree by the existing operating constraints of the scheme which would assist in maintaining ecological values. Groundwater movements are not expected to alter, and no effects are expected from that source.

Braided river vegetation

The modified flow regime in the Takapō River resulting from the operation of the Tekapo PS appears to have favoured the spread of exotic species and vegetation of the Takapō River, with the river habitat now comprising mostly exotic species. The [Briar rose] / (*Muehlenbeckia axillaris*) herb – stonefield community comprises the majority of the vegetation in the Takapō River today where reduced flows have created smaller, less isolated shingle bars and islands, with larger areas of the riverbed now stabilised by vegetation, particularly weed species. This has been exacerbated by historic planting of species such as crack willow (*Salix fragilis*) by the former Catchment Board and the CRC. More recently willow clearance has been undertaken in an effort to restore natural patterns and flood protection works to stabilise the river. involving the use of machinery to grade the riverbed and planting alter the habitat available for specialist braided river birds.

Plant species adapted to the unstable braided river environment have been adversely affected by the reduction in suitable habitat, particularly in the upper Takapō River, but the lack of seed sources in the upper river has also likely adversely affected the lower river as well.

Given that Genesis proposes no change to the flow regime in the Takapō River, and that the vegetation surrounding the Takapō River has remained similar since at least 1991, Ecological Solutions considers that no changes to the vegetation are expected from continued operation of the Tekapo PS.

Lake edge habitats

The lake edge habitats range from steep boulder banks above the water line with few to no native plant species to flat turf communities with a range of native monocots, dicot herbs, rushes and sedges. These communities have developed since the Tekapo A Power Station was commissioned in 1951 and given no change in operating parameters is proposed, these communities are expected to persist in their current form.

Effects on species of conservation interest

Only one species which is regarded as “threatened (nationally vulnerable)” (*Carmichaelia corrugata*, dwarf common broom) was detected during the surveys undertaken by Ecological Solutions, along with nine species which are regarded as “at risk (declining)” The majority of these species, including the dwarf common broom, were seen in short tussock grassland habitat near the Tekapo Canal with the remainder in other habitats, none of which would be affected by the continued operation of the Tekapo PS. Matagouri is more widespread around the area including near the lake edge and would not be affected since there are no plans to alter the lake management regime.

Given their ongoing persistence under the current operating regime, for any species which are most at threat due to habitat removal or mammals, adverse effects on the species of conservation concern due to continued operation of the Tekapo PS are not expected. For species of disturbed sites, the continued operation is not expected to allow the type of infrequent disturbance events (particularly floods) which would lead to new habitats becoming available, particularly within the Takapō River. The majority of such species have already gone from the vicinity of the Tekapo PS because of the water management regime over the past 70 years, and those which remain are the species which can tolerate the operating regime. None of the threatened or at-risk species detected near the scheme were located in such close proximity to the scheme infrastructure that they would be affected by changing lake levels.

Project River Recovery

The PRR approach in relation to vegetation has been as follows:

a. With respect to wetlands, to develop new habitat, or to enhance degraded habitat, in an attempt to increase the amount of good quality wetland habitat in the vicinity of the WPS; and

b. With respect to braided rivers, to control and remove weeds, particularly within the more pristine upper catchments (above the hydroelectricity lakes).

The Ecological Solutions report notes that PRR continues to accord high priority to preventing weed invasions of the catchments above the hydro lakes, including spending considerable time and resources on targeted weed control in eight riverbeds (Godley, Macauley, Cass, Tasman, Ōhau, Ahuriri, Twizel and Pūkaki), four streams (Coal, Mistake, Fraser and Fork), three wetlands (Ruataniwha, Fraser Stream and Waterwheel) and three lake shore sites (Ōhau, Poaka and Ruataniwha), as well as contributing to landowner weed control in the upper Takapō River, the Dobson River and upper Ahuriri River and undertaking substantial pest control efforts, species monitoring and wetland management.

With respect to the mitigation of the indigenous vegetation effects of the WPS since the water rights were granted in 1991, Project River Recovery has focussed on removal of weeds from headwater catchments, surveillance of weeds and creation or enhancement of wetland habitats. Project River Recovery has made a substantial contribution to maintaining indigenous vegetation in the Waitaki catchment, particularly with respect to weed control. Ecological Solutions consider that Project River Recovery is effective at achieving its goals for braided river recovery and wetland enhancement.

5.11.5 Regional Policy Statement Criteria

Appendix 3 of the RPS identifies criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity. The RPS significance criteria are addressed separately in the appended assessment reports as appropriate.

The ecological features have been assessed against the relevant criteria by in the terrestrial invertebrate report (Appendix O), herpetofauna report (Appendix P), avifauna report (Appendix Q) and vegetation report (Appendix R) as part of the assessment of the effects described above.

5.12 LANDSCAPE AND VISUAL AMENITY EFFECTS

5.12.1 Landscape and Visual Amenity

The Tekapo PS and canals are an existing part of the landscape character of Takapō. Furthermore, the MDP specifically provides for hydro-electricity generation by scheduling, as a permitted activity, works associated with the maintenance, operation, upgrading and refurbishment of the existing electricity generation facilities within the Rural Zone. While the consents being sought relate to the taking, diverting, damming and discharges associated with the Tekapo PS, Genesis is not proposing to further modify the landscape (i.e., via changing the operational parameters associated with the scheme) or introduce any new structures into the landscape as part of these consent applications. The Tekapo PS will therefore not cause additional effects on the biophysical, perceptual or associative landscape attributes of the associated waterbodies and landscape context. The natural elements, patterns and processes of the river and lakes will not be further modified, other than what the current operation of the power scheme permits.

Based on this, there will be no additional landscape effects of the scheme compared to the status quo.

This proposal will not change the existing views, landscape amenity values, water clarity or general vistas associated with the area. Based on this, there will be no additional visual effects of the scheme compared to the status quo.

5.13 FLOOD MANAGEMENT

As noted in section 2.13, the current Tekapo flood rules prescribe a minimum discharge from Takapō as a function of the lake level above MCL; as the lake level increases further above MCL the minimum discharge requirement increases. Provisions for establishing modified flood rules are included in the consent conditions in **Appendix D**.

The changes to the flood rules do not have any implications in terms of the WAP provisions for existing activities (i.e., changes to the flood rules will not change the activity status for these applications) but will provide an effective management tool for achieving

the limits specified in the WAP during peak inflow events. In particular, the modified rules will be designed to provide for safe passage of the Probable Maximum Flood[144] ("**PMF**") via Gate 16 and the Lake George Scott Control Weir during significant flood events.

5.14 RECREATION EFFECTS

Rob Greenaway & Associates 2023 has identified the recreation and tourism values of Takapō, the Takapō River and the Tekapo Canal, identified trends in recreation and tourism patterns since 1990 and provides an assessment of the degree to which the operation of the Tekapo PS has influenced this. In addition, the report addresses the likely future trends in participation out to 2060. In summary:

1. There is limited quantitative trend data available to ascertain the long terms trends in recreation participation within the study area. The key resource used in the assessment is the national angler surveys undertaken by the New Zealand Fish and Game Council;

2. The national angler surveys indicate that there has been a decline in angling activity on the Takapō River that is coincident with the arrival of didymo in 2007 while over the same time period there has been a significant increase in angling activity on the Tekapo Canal and on Takapō;

3. Commercial accommodation monitoring in the Mackenzie District indicates a steady growth in tourism;

4. The operation of the Tekapo PS controls kayaking and jet boating opportunities on the Takapō River via the release of recreation flows. The frequency of these flows is being discussed with the Tekapo White Water Trust. Activities associated with the operation of the Tekapo PS can impact the opportunities for recreation in and around the Takapō River;

5. The assessment found that interviewees reported an increase in the frequency and duration of low lake levels in Takapō (resulting from the operation of the Tekapo PS) over the past three to five years, although similar statements were made in similar research in 2004 (when Meridian Energy operated the scheme). Low lake levels are considered to have adverse effects on recreation and tourism due to a reduction in scenic values, a loss of water space for recreation, dust effects, exposure to navigational hazards and increased difficulty in launching boats;

[144] An estimate of a hypothetical flood (peak flow, volume and hydrograph shape) that is considered to be the most severe "reasonably possible" at a particular location and time of year (New Zealand Dam Safety Guidelines, 2015). The current PMF estimate methodology used in NZ is highly conservative.

6. Lake level records show that Genesis has operated Takapō on average 0.295m lower from 2011-2020 than did Meridian Energy from 2000-2010 (although the average lake levels from November to June are very similar), and Meridian operated the lake at lower average levels than ECNZ did prior to 2000; and

7. Growth projections out to 2050 suggest that there will be a potential doubling in outdoor recreation participation by residents and a tripling in participation by visitors over a 30-year period. The assessment considers that this substantial increase will result in significant pressure on recreation facilities and there will be an additional need for recreation infrastructure, management and regulation.

The Rob Greenaway & Associates assessment concludes that, overall, the Tekapo PS has provided significant recreational opportunities for angling, and the operation of Takapō for hydro generation maintains its traditional recreational and scenic values. Walking and cycling opportunities have developed around generation infrastructure and now provide significant activity opportunities for visitors and residents.

As noted in section 5.2, the Tekapo PS has also resulted in improved fishery experiences (for introduced species) within the Tekapo Canal and other opportunities for recreational experiences that attract visitors to the area. The Te Manahuna Mackenzie Basin hydro canal fishery (which includes the Tekapo, Pūkaki and Ōhau canals) was estimated to have a total economic impact of $13.6 million for the 2022-2023 fishing season, representing 3.5% of the total GDP of the region.

5.15 CONCLUSION

This section of the AEE has been informed by comprehensive technical assessments commissioned by Genesis to assess the potential environmental effects associated with the continued operation of the Tekapo PS.

Overall, and based on the technical assessments that have been prepared, it is considered that the continued operation of the Tekapo PS will appropriately avoid, remedy or mitigate potential adverse effects on the environment. The assessments also demonstrate the positive effect that Project River Recovery has had on terrestrial invertebrates, lizards, water birds and vegetation.

Where more than minor ongoing adverse effects on a significant value have been identified mitigation measures have been assessed. Measures are detailed in the following section for avoiding, remedying or mitigating adverse effects of the ongoing operation of the Tekapo PS, which are also reflected in the proposed resource consent conditions proffered by Genesis in **Appendix D**.

6. OPERATING PARAMETERS, PROPOSED MITIGATION, MANAGEMENT METHODS AND MONITORING

6.1 INTRODUCTION

This section of the AEE describes the operating parameters of the Tekapo PS sought by Genesis, and details how the ongoing operation of the Tekapo PS will be managed to ensure that actual and potential adverse effects on the environment are appropriately avoided, remedied, mitigated or compensated. Further detail on the measures proposed is provided with the draft consent conditions attached as **Appendix D** to this AEE. The draft Lake Takapō / Tekapo High Flow Management Plan referred to in proposed Schedule One General Condition 2, the Sports Fish Salvage Management Plan referred to in condition 17 and the draft Lakeshore Erosion Management Plan for Lake Takapō / Tekapo referred to in condition 38 are included in **Appendix E**. **Appendix E** also includes the draft Strategic Plan for implementation of the indigenous biodiversity enhancement programme referred to in draft general condition 30.

6.2 PROPOSED OPERATING PARAMETERS

6.2.1 Takapō Operating Lake Levels

Genesis is proposing to carry over the existing lake level regime (which is provided for in the WAP). The proposed consent conditions[145] authorise a lake level regime as detailed in Figure 37 which shows the maximum control level (top blue line) and minimum control level (bottom orange solid line). Figure 37 also shows monthly mean lake levels for selected time periods from 1926 and illustrates that lake levels fall between the specified control levels.

Figure 37 also shows (orange dotted line) the minimum lake level of 701.8 masl during the months of October to March for hydro-electricity generation uses when the aggregate storage for New Zealand or the South Island is below the relevant trigger level specified in the New Zealand electricity network System Operator policy and reserve generation capacity is required.

[145] For example, see proposed water permit conditions 6 – 8, Schedule One General Condition 1.

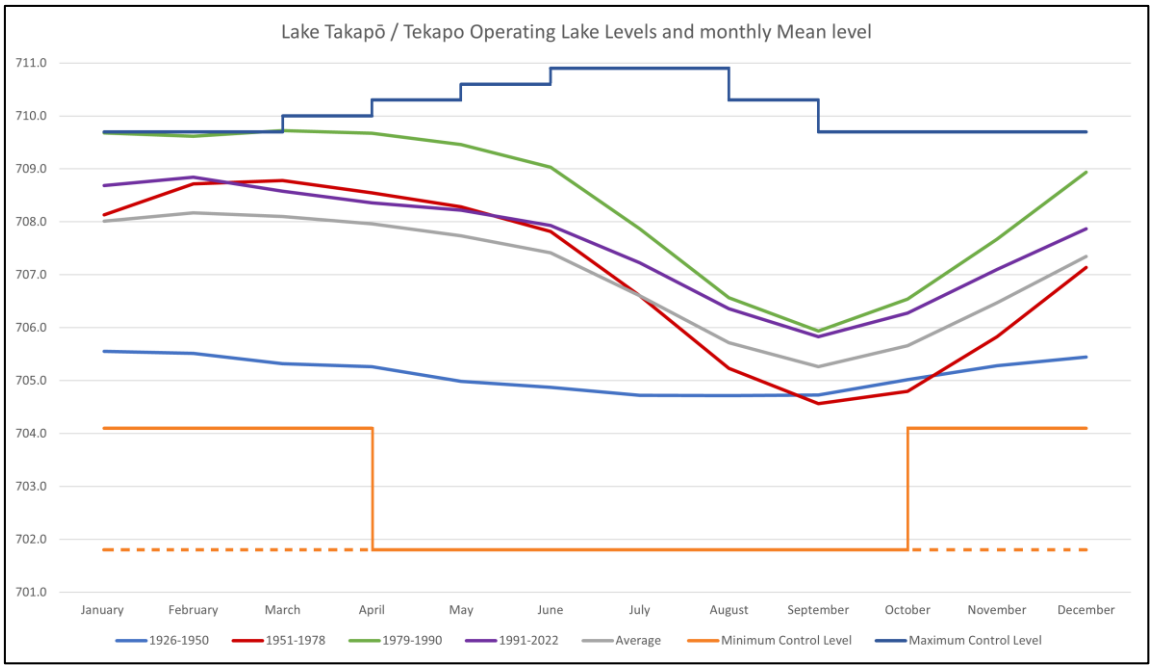

Figure 37: Takapō Operating Lake Levels

6.2.2 Take and Discharge Rates

Genesis is proposing a continuation of the current water take, diversion and discharge rates as follows:

1. To take water from Takapō at a rate of 130 m^3/s, at a maximum quantity of 11.232 x 10^6 m^3/day. In accordance with the water allocation provisions of the WAP, Genesis is seeking the allocation available upstream of the Takapō outlet as is provided for by way of the existing resource consents for the Tekapo PS. That is, Genesis is seeking that these resource consents allocate "all other inflows" to the operation of the Tekapo PS as provided for in Table 5 in the WAP; and

2. To discharge up to 130 m^3/s into Lake Pūkaki; and

3. To discharge to the Takapō River from the Lake Tekapo Control Structure (for example, for spill events and recreational releases above lake George Scott weir and situations where Tekapo A needs to be bypassed) at the structure design rate of up to 850 m^3/s; and

4. To discharge to the Takapō River from the Lake George Scott Control Weir at the structure design rate of up to 600 m^3/s.

6.3 BIODIVERSITY ENHANCEMENT

As described in section 1.5.14, Genesis is proposing to continue (and increase) its funding for an indigenous biodiversity enhancement programme ("**IBEP**") as a core part of the

replacement resource consents being sought, to mitigate the effects of the Tekapo PS on the environment. Through an agreement with Meridian and DoC, the IBEP will focus on improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment.

A Governance Group was established to oversee the governance of, planning for, and implementation of the first Strategic Plan ("**Kahu Ora**") for the IBEP. The Governance Group comprises DoC, Te Rūnanga o Arowhenua, Te Rūnanga o Moeraki, Te Rūnanga o Waihao, Meridian, and Genesis representatives.

The Kahu Ora Strategic Plan has been prepared by a strategic plan team, comprised of representatives for DoC, Waitaki Rūnaka and the generators, and reporting to the Governance Group. The implementation and delivery of Kahu Ora will be managed and led by DoC.

The proposed consent conditions in Appendix D require preparation of a strategic plan that sets out how the IBEP will be implemented over a 10-year planning horizon, with an initial strategic plan cover intended actions to implement the programme over the first 10-year period of the resource consent duration. A draft of Kahu Ora (the first strategic plan" for the IBEP is included in Appendix E and the following sets out the intended scope of Kahu Ora.

6.3.1 Scope

The proposed IBEP focuses on the wider Waitaki Catchment and will take account of, and address matters such as the Mana whenua connection to the catchment, the ecological importance of braided rivers, lakes and wetlands, pressures on the ecological integrity of braided rivers, lakes and wetlands and hydro-electric development in the Waitaki catchment.

The strategic plan for the IBEP is being prepared by experienced (both in terms of qualifications and with respect to the catchment itself) Department of Conservation ecologists in conjunction with Waitaki Rūnaka and Genesis and Meridian advisors. The ecologists and Waitaki Rūnaka advisors have determined the relevant actions and priorities for expenditure of the programme funds provided by Genesis and Meridian to ensure that the IBEP objective is met. The objective of the IBEP is to:

> *Improve the condition, resilience, biodiversity, ecological processes and other values of representative examples of the following features within the Waitaki Catchment:*
>
> *a) Lake margins and deltas;*
>
> *b) Wetlands and springs associated with lakes and braided rivers;*

c) *Braided rivers (both aquatic, within the braid plain) and their margins; and*

d) *Areas of connection between these features.*

6.3.2 Karakia and Whakataukī

Karakia and Whakataukī underpinning the process are:

Karakia

Mā te mōhio, ka mārama	*By discussion comes understanding*
Mā te mārama, ka mātau	*By understanding comes enlightenment*
Mā te mātau, ka tau te mauri ora	*By enlightenment comes wisdom*
O kā taoka katoa	*With wise consideration the sacred essence of life*
Mō kā uri whakaeke mai rā	*Imbued in all living things*
Mō ake tonu atu	*May manifest as life sustaining treasures* *For all generations to come*

Whakataukī

Tē tōia, tē haumitia

Nothing can be achieved without a plan, work-force, and a way of doing things.

6.3.3 Programme Extent

The programme will be divided into four zones covering the upper Waitaki catchment rivers, lakes and their wetlands, mid-catchment rivers and their wetlands, the Waitaki and Ruataniwha lakes and their wetlands and the Lower Waitaki River and its wetlands.

The four geographic zones used for development of the strategic plan are shown in Figure 38.

It is intended that the funds allocated by Genesis and Meridian will be spent proportionately across the four zones as indicated in Table 20.

Each of the four zones is discussed below, including the vision for the zone, the expected actions for the zone for the first 10-year strategic plan period and the expected outcomes for that period.

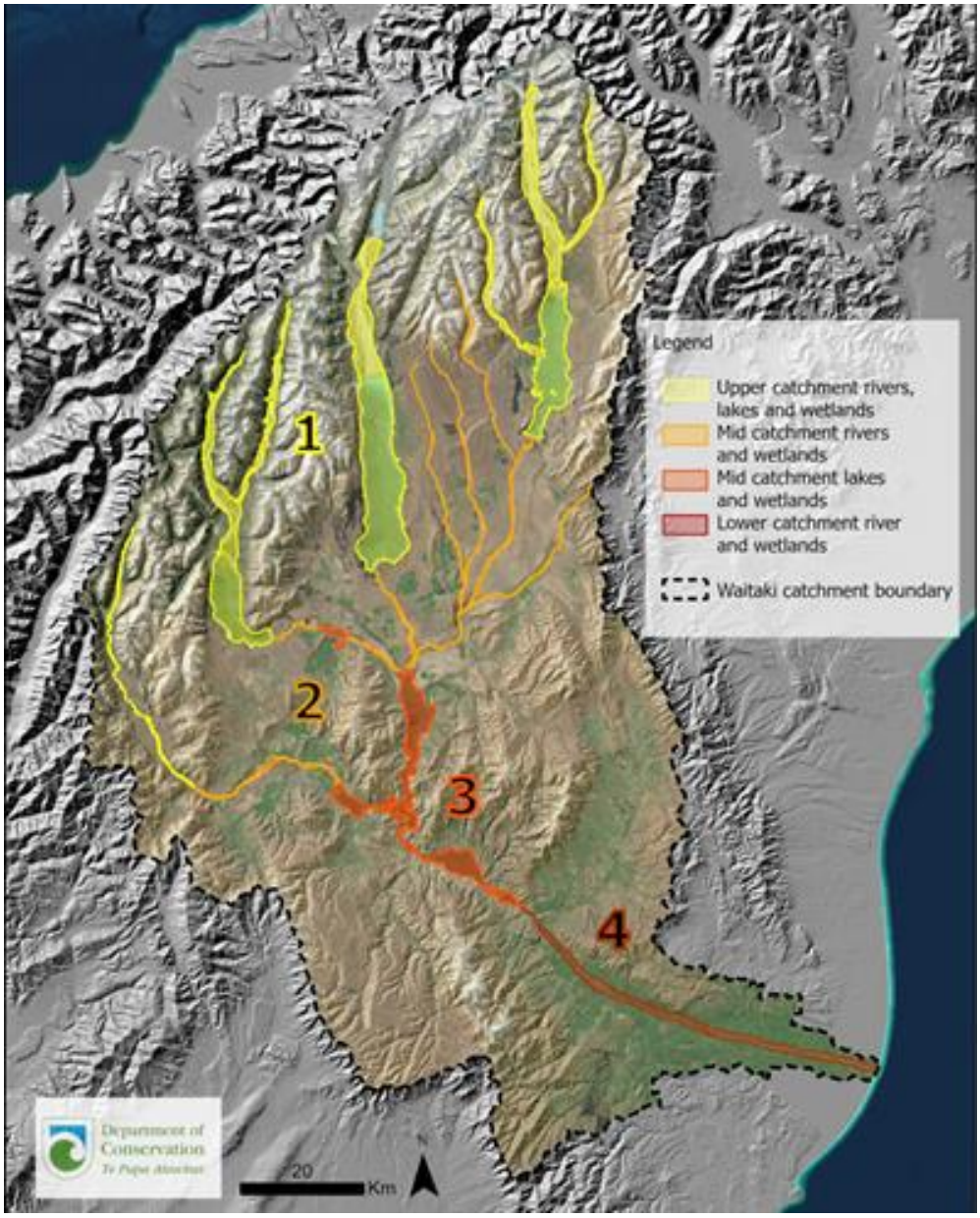

Figure 38: **Map of the Four IBEP Geographic Zones.**

Table 20: **Expenditure Across the Four IBEP Zones.**

Zone	Proportion of Expenditure
1. The upper catchment rivers, lakes and their wetlands	32%
2. The mid-catchment rivers and their wetlands	35%
3. The Waitaki and Ruataniwha lakes and their wetlands	2%
4. The Lower Waitaki River and its wetlands	31%

6.3.4 Zone 1

The geographic area of Zone 1 is shown in Figure 39.

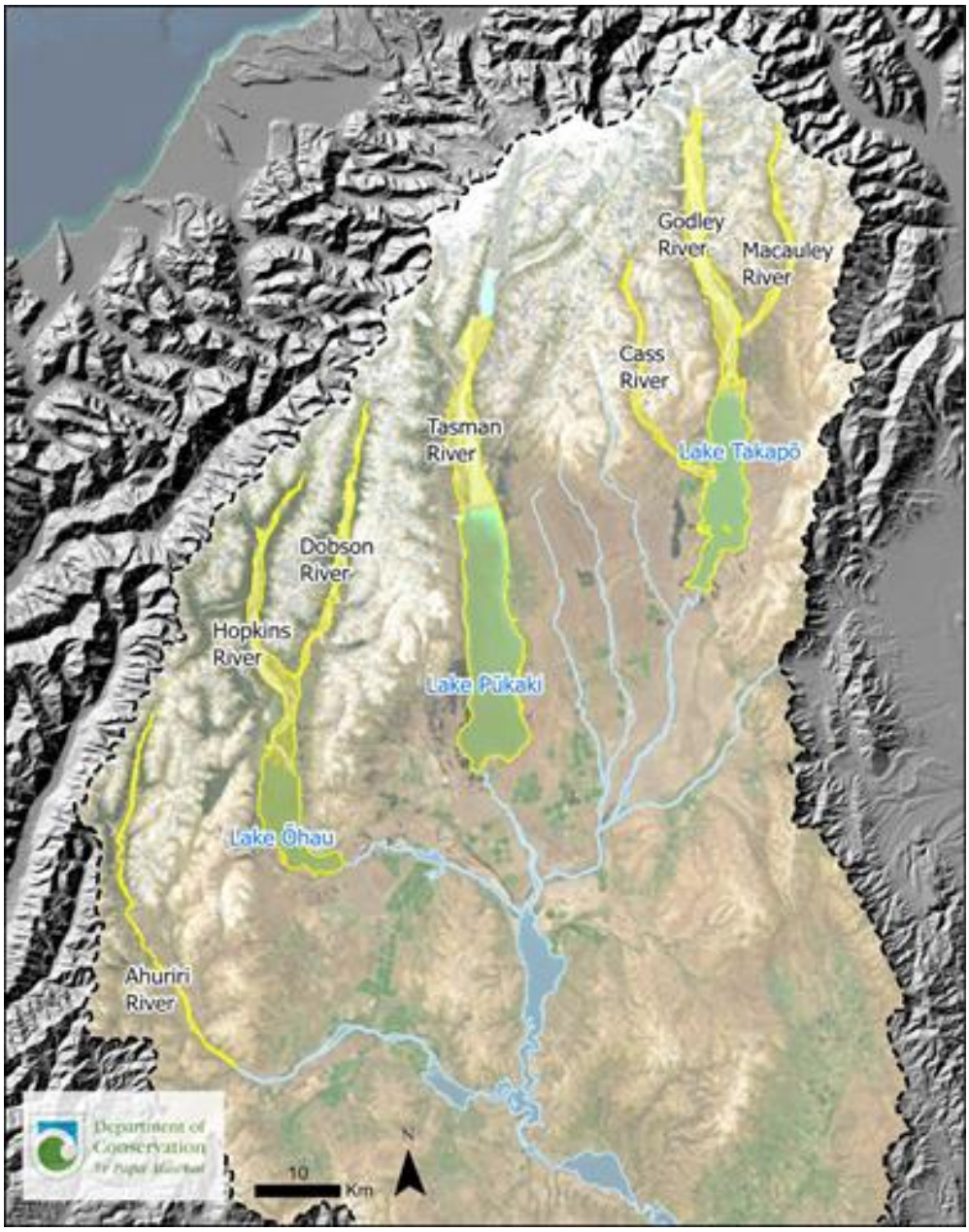

Figure 39: Map of Zone 1 Showing Key Features.

The present long term (35 years) vision for Zone 1 is summarised as follows:

1. Habitat available for indigenous flora and fauna is maintained by:

    a. Preventing further invasions and eliminating current populations of weedy species in braided river habitat;

    b. Reducing the impacts of weedy species to wetland and lake edge habitat; and

2. Stable and growing populations of indigenous flora and fauna are supported by suppressing populations of browsers and predators; and

3. Opportunities for improving and implementing cultural values are provided.

The proposed actions, areas and proportion of expenditure across each area for achieving the first 10–year stage of the 35-year vision for Zone 1 are summarised in Table 21.

Table 21: Proposed Zone 1 10 Year Action Plan Components.

Action		Tasman River	Cass River	Dobson River	Godley River	Macauley River	Upper Ahuriri River	Wetlands	Lake Takapō	Lake Pūkaki	% Expenditure
Weed control		✓	✓	✓	✓	✓	✓	✓	✓	✓	36%
Predator control	Mammals	✓									25%
	Karoro	✓	✓	✓	✓	✓	✓				
Grazer & browser control		✓	✓		✓						5%
Education & advocacy		✓	✓	✓	✓	✓		✓	✓	✓	2%
Fill knowledge gaps								✓			8%
Monitor success		✓	✓	✓	✓	✓	✓	✓	✓	✓	9%
Project delivery		✓	✓	✓	✓	✓	✓	✓	✓	✓	14%
% Expenditure		48%	11%	6%	16%	3%	1%	1%	7%	7%	100%

The anticipated effects of the proposed biodiversity actions in Zone 1 over the first 10-year period of implementation of the IBEP are summarised as:

1. Habitat for indigenous flora and fauna will be secured by controlling weeds in 5 rivers and on lake shores;

2. Indigenous flora values will be protected by maintaining low densities of exotic grazers and browsers in 3 rivers;

3. Indigenous bird values will be protected by maintaining low densities of karoro in 6 rivers;

4. Indigenous invertebrate, lizard and bird values will be protected by suppressing densities of predatory mammals in 1 river, and indirectly through rabbit control in an additional 2 rivers;

5. Wetland values, their pressures and their requirements for enhancement and protection are understood; and

6. Users will be informed of ecological and cultural values by installing educative signage at 5 braided rivers, 3 lake shore areas and 3 wetland habitats.

6.3.5 Zone 2

The geographic scope of Zone 2 is shown in Figure 40.

The present long term (35 years) vision for Zone 2 is summarised as follows:

1. Habitat availability for indigenous flora and fauna is increased by reducing impacts of weeds, and by creating river islands;

2. Stable and growing populations of some threatened species of indigenous flora and fauna are supported by suppressing predators and browsers at high value sites;

3. Opportunities for improving and implementing cultural values are provided.

The proposed actions, areas and proportion of expenditure across each area for achieving the first 10–year stage of the 35-year vision for Zone 2 are summarised in Table 22:

The anticipated effects of the proposed biodiversity actions in Zone 2 over the first 10-year period of implementation of the IBEP are summarised as:

1. Habitat availability for indigenous flora and fauna will be increased by removing exotic weeds from the Forks Stream, the upper Takapō River, and 120Ha of wetland habitat; and by planting and manipulating hydrology in 8 wetlands in the upper Takapō River;

2. Indigenous flora values will be protected by maintaining low densities of rabbits in 1 river and 1 wetland;

3. Indigenous river bird values will be protected by maintaining low densities of karoro across 4 rivers , and maintaining 1 and establishing 8 islands through the Upper Ōhau and Takapō Rivers respectively;

4. Indigenous invertebrate, lizard and bird values will be protected by supressing mammalian predators throughout 1 wetland, and 1 diversity hot-spot in each of the Ōhau and Takapō Rivers;

5. Indigenous fish values will be protected by eliminating trout from upstream of the trout barriers in the Forks Stream;

6. Users will be informed of ecological and cultural values by educative signage installed at 4 braided rivers, 3 wetlands, and 2 significant tributaries;

7. Additional opportunities to protect indigenous fish values throughout the zone will be understood; and

8. The requirements of indigenous river terrace and lake moraine flora protection will be understood.

Table 22: Proposed Zone 2 10 Year Action Plan Components.

Action		Takapō River	Pūkaki River	Upper Ōhau River	Lower Ōhau River	Fork Stream	Mary Burn	Irishman Creek	Glenburn Wetlands	Gray Wetlands	Ruataniwha Wetlands	% Expenditure
Weed control		✓		✓		✓				✓	✓	40%
	Mammals	✓		✓								
Predator control	Karoro	✓	✓	✓	✓							18%
	Trout					✓						
Grazer & browser control		✓									✓	4%
Education & advocacy		✓	✓	✓	✓	✓	✓		✓	✓	✓	2%
Habitat Enhancement		✓		✓							✓	4%
Fill knowledge gaps		✓	✓	✓				✓				8%
Monitor success		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9%
Project delivery		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14%
% Expenditure		57%	1%	10%	0%	15%	0%	0%	0%	11%	5%	100%

Figure 40: Map of Zone 2 Showing Key Features.

6.3.6 Zone 3

The geographic scope of Zone 3 is shown in Figure 41.

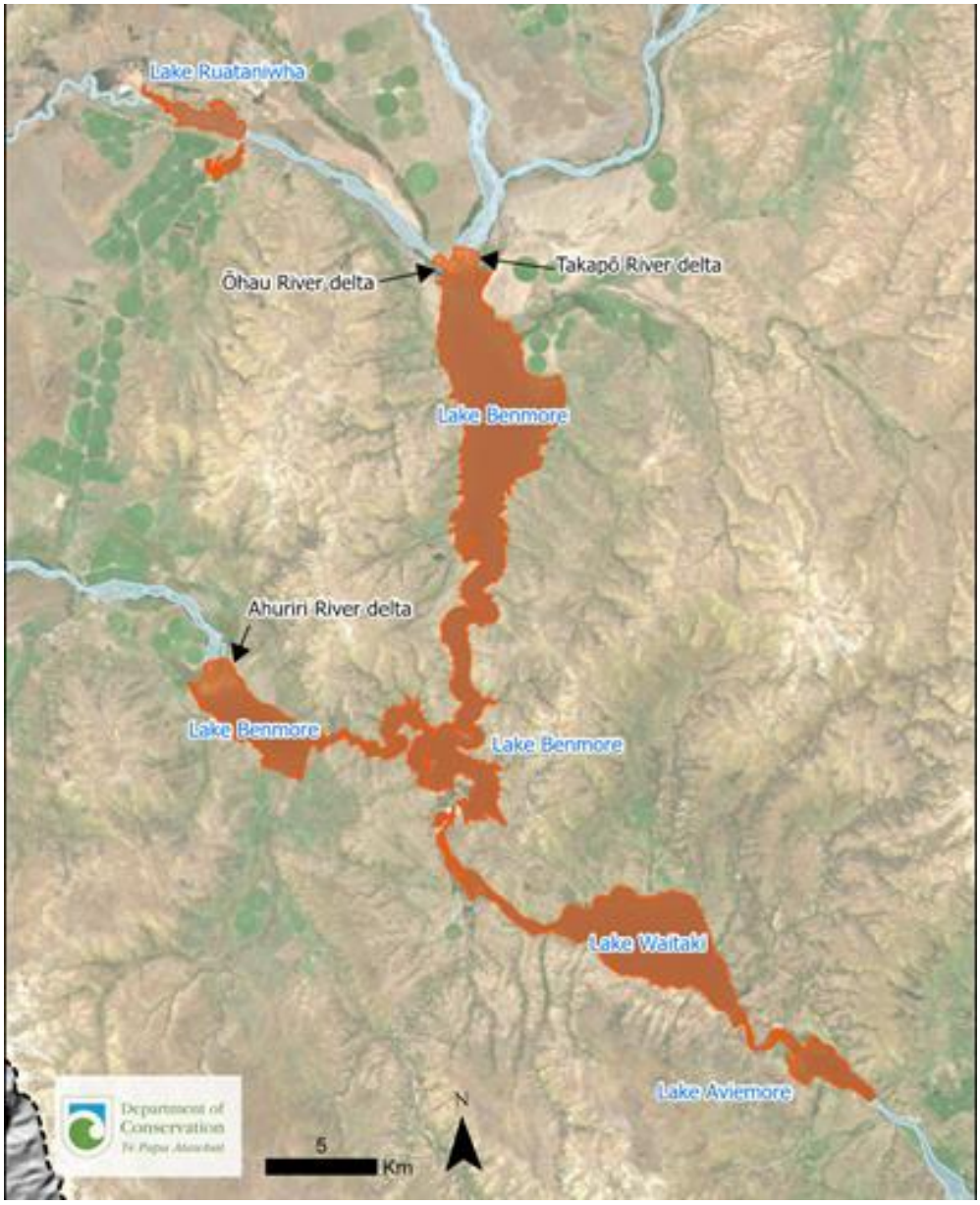

Figure 41: Map of Zone 3 Showing Key Features.

The present long term (35 years) vision for Zone 3 is summarised as follows:

1. The impacts of weeds to some wetland, delta and lake edge habitats are reduced;
2. The quality of some wetland and lake edge habitat is improved by indigenous plantings;
3. Predators and browsers are suppressed at high value sites;
4. Opportunities for improving cultural values, including Mahika kai provisions, are understood and implemented.

The proposed actions, areas and proportion of expenditure across each area for achieving the first 10–year stage of the 35-year vision for Zone 3 are summarised in Table 23:

Table 23: Proposed Zone 3 10-Year Action Plan Components.

Action	Lake Aviemore	Lake Benmore	Lake Waitaki	Lake Ruataniwha	Wetlands	% Expenditure
Weed control		✓		✓		48%
Education & advocacy	✓	✓	✓	✓	✓	7%
Fill knowledge gaps		✓			✓	22%
Monitor success	✓	✓	✓	✓	✓	9%
Project delivery	✓	✓	✓	✓	✓	14%
% Expenditure	3%	72%	14%	9%	2%	100%

The anticipated effects of the proposed biodiversity actions in Zone 3 over the first 10-year period of implementation of the IBEP are summarised as:

1. Habitat quality and extent will be improved through weed control at 1 delta and 1 bay area;
2. Island and peninsula restoration opportunities at Lake Benmore will be understood;
3. Wetland values around the four lakes will be understood; and
4. Users will be informed of ecological and cultural values by educative signage installed at 4 lakes and 2 wetlands.

6.3.7 Zone 4

The geographic scope of Zone 4 is shown in Figure 42.

The present long term (35 years) vision for Zone 4 is summarised as follows:

1. Wetlands of different types are restored to benefit a range of values including, but not limited to, indigenous flora and fauna, ecological function, and cultural (including mahika kai);
2. Indigenous river bird values are supported through predator control and availability of high-quality river islands;
3. Invertebrate, bird, lizard and fish values and their requirements for protection are understood; and
4. Flood protection works align with ecological and cultural values where possible.

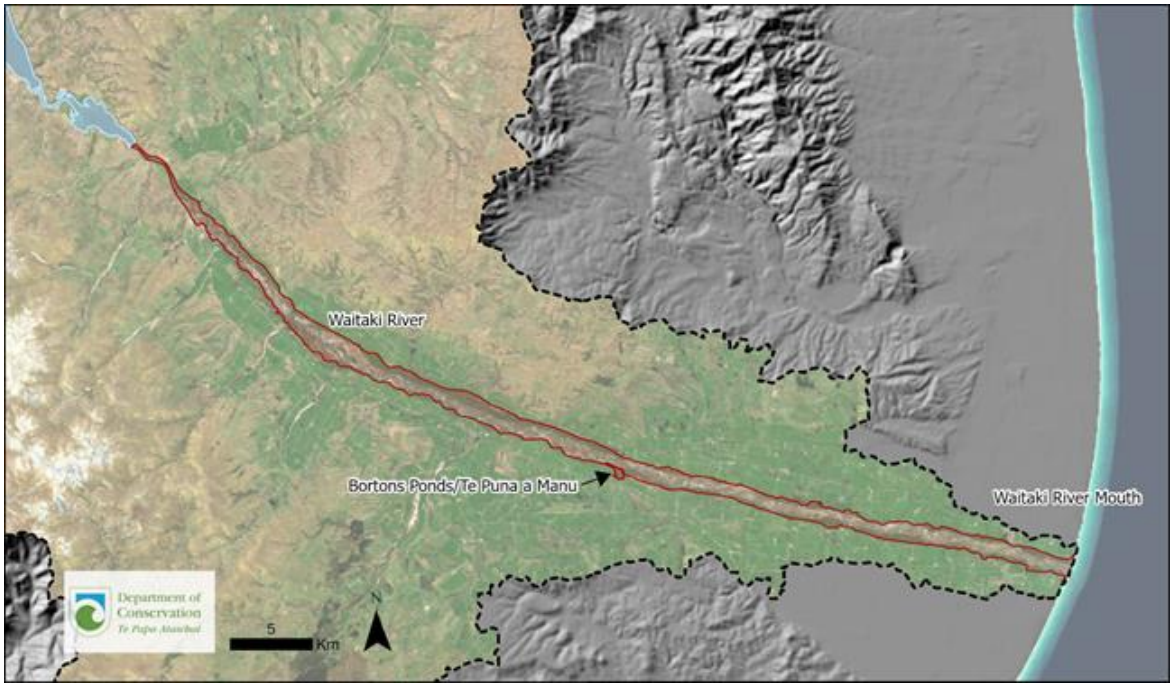

Figure 42: Map of Zone 4 Showing Key Features.

The proposed actions, areas and proportion of expenditure across each area for achieving the first 10–year stage of the 35-year vision for Zone 4 are summarised in Table 24.

Table 24: Proposed Zone 4 10-Year Action Plan Components.

Action	Lower Waitaki River	Te Puna a Maru	Rūnaka Restoration Site 2	Wetlands	River mouth	% Expenditure
Weed control only				✓		12%
Predator control (karoro)	✓					10%
Habitat Enhancement						
Rūnaka restoration sites (includes weed control)		✓	✓			40%
Bird islands	✓					
Education & advocacy	✓	✓	✓	✓	✓	2%
Fill knowledge gaps	✓					13%
Monitor success	✓	✓	✓	✓	✓	9%
Project delivery	✓	✓	✓	✓	✓	14%
% Expenditure	26%	26%	28%	18%	1%	100%

The anticipated effects of the proposed biodiversity actions in Zone 4 over the first 10-year period of implementation of the IBEP are summarised as:

1. Wetland values will be maintained through weed control at 5 sites;

2. Indigenous river bird values will be supported through karoro control, the creation of and maintenance of 8 river islands, and seasonal vehicle restrictions at the river mouth;

3. Cultural wetland restoration and mahika kai values will be supported at Te Puna a Maru and 1 other site;

4. Indigenous invertebrate, bird and wetland values will be understood throughout Zone;

5. Ecological and cultural values will benefit from flood protection works where possible; and

6. Users will be informed of ecological and cultural values by educative signage installed at 1 river site, 2 wetlands, and 2 rūnaka wetland restoration sites.

6.3.8 Consent Conditions

The environmental compensation conditions proposed for implementing the IBEP are presently under discussion with the Department of Conservation, Te Rūnanga o Arowhenua, Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Meridian. Draft conditions included in Appendix D are those proposed with the 2023 application to the CRC and are indicative of the conditions Genesis will accept. However, they are subject to change given the discussion presently underway. The IBEP Strategic Plan referred to in the consent conditions and provided as a draft with this application (Appendix E) has been prepared in accordance with the draft conditions in consultation with the Department of Conservation, Te Rūnanga o Arowhenua, Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Meridian.

An updated set of conditions will be provided to the Panel well prior to a decision being made on the applications.

6.4 CULTURAL MITIGATION

Genesis has worked collaboratively with Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki (“**Waitaki Rūnaka**”) prior to lodging the application and will continue to do so throughout the application process. As a result of those discussions, the Waitaki Rūnaka and Te Rūnanga o Ngāi Tahu provided letters of support for the RMA application, attached in **Appendix B**. Te Rūnanga o Ngāi Tahu and the Waitaki Rūnaka subsequently confirmed that support in relation to this Fast-track application.

As set out in their letters of support, the Waitaki Rūnaka have recognised the significance of the waters of the Waitaki alongside the significance of the hydro electricity generation

to the nation and adopted an intergenerational approach to protecting the health and well-being of the Waitaki Catchment. Waitaki Rūnaka have therefore worked collaboratively with Genesis and Meridian to develop a package that includes:

1. Conditions that are to be attached to the resource consents;[146]
2. A mitigation package for the duration of the consents;
3. An enhanced relationship agreement between Genesis/Meridian and Waitaki Rūnaka; and
4. A suite of measures (including financial) that further provide for the management of adverse effects on Waitaki Rūnaka with this Kāi Tahu taonga.

The four components of this package recognise that restoration of the Waitaki Catchment requires time, capacity, commitment, collaboration and importantly resourcing. This approach recognises Ngā Rūnaka rangatiratanga over the Waitaki Catchment and its taonga, including wai māori, and enables greater economic, spiritual and cultural connections for mana whenua.

As recorded in the letters of support, Waitaki Rūnaka understand that the replacement consents will enable the continued operation of the Waitaki Power Scheme for a 35-year term and that no material changes to the current activities and existing consent flexibility of the Waitaki Power Scheme are proposed.

The Genesis applications propose no material changes to the present Tekapo PS operation and matters identified by Waitaki Rūnaka with respect to the proposed consent conditions are addressed in the proposed conditions in **Appendix D** which have been discussed with them. All other matters are addressed through the relationship agreement between Genesis and Waitaki Rūnaka.

6.5 FISHERY ENHANCEMENT

Work has been underway since the 1980s to maintain and enhance the brown and rainbow trout fishery in Lake Alexandrina by improving spawning habitat in the lakes only inflowing stream, Scott's Creek, as well as the lake's outflow, Outlet Creek. As discussed in section 2.11.5 of this AEE Genesis and Fish and Game are working to enter an agreement with respect to Fish and Games' interests and would allow Fish and Game to support the consents being granted.

[146] Proposed Schedule One General Conditions 24 – 35.

The focus of this work will now change to supporting fishery enhancement more generally. In that regard, Genesis will continue to provide Fish and Game with funds to assist with managing, maintaining and enhancing the Tekapo Sports Fishery including:

(a) Fishery management, including providing equipment and managing angler facilities and access;

(b) Fisheries enhancement projects within the Upper Waitaki Catchment;

(c) Costs associated with sports fish salvage associated with operation of the Tekapo PS; and

(d) Monitoring, research and investigations.

In addition:

(a) Fish and Game and Genesis have developed a Fish Salvage Management Plan to reduce sports fish mortality following certain flow events in the Takapō River. This, and other matters such as ramping rates, are contained within the proposed consent conditions.

(b) Genesis will continue to use reasonable endeavours to continue existing public access to fishing and hunting areas.

6.6 AMENITY

Consistent with its existing mitigation agreement with MDC covering funding for the Tekapo community and appropriately managing the effects of Genesis' lake level operations on the Lake Alexandrina causeway and Takapō boat ramps, Genesis has discussed the following matters with MDC:

a) Advice to the Community Board of the national hydraulic conditions resulting in the low water levels, the likely trends in water storage and usage from Takapō, measures in place to conserve Takapō storage and works (if any) proposed to minimise the creation of dust whenever the level of Takapō falls below 704.5 masl;

(b) Provision of funding for a Community Fund, to be distributed via a contestable fund, to support community enrichment, education or environmental enhancement initiatives in the Tekapo community and which ensure future sustainability of the natural assets of these areas;

(c) Provision of funding to the MDC for use to enhance the amenity (including recreational) values of the Takapō foreshore / lakeshore, including undertaking preliminary design or planning works that may be required; and

(d) Undertaking periodic inspections of the causeway adjoining Lake McGregor, as requested by Council or Genesis from time to time for the purpose of ensuring its

physical integrity and to identify any remedial works required to the causeway resulting from Genesis' operation of the Tekapo PS (Genesis would be responsible for obtaining any consents necessary and undertaking any works for remedial works arising from the operation of the Tekapo PS).

6.7 WHITEWATER RECREATION

The present mitigation agreement with Tekapo Whitewater Trust / Whitewater New Zealand provides for flows to be made available specifically for recreation in the Takapō River and Tekapo slalom course. Genesis has discussed this application with the Trustees of the Tekapo Whitewater Trust, and with Whitewater NZ, focusing on the operation of the Tekapo PS and recreational releases of water and has reached agreement with Tekapo Whitewater Trust / Whitewater NZ to continue provision of recreational flows as set out below. Conditions relating to recreational water releases are incorporated into the proposed conditions[147] in **Appendix D**.

6.7.1 Context

To provide a background context for the proposed consent conditions, the history of planned Upper Takapō River recreational releases is described below.

Rob Greenaway & Associates 2023[148] references available information (a 1981 New Zealand Recreational River Survey) about in-river recreational use for the Tekapo River before the commissioning of Tekapo A in 1951:

> *Previously, the river had good white water over the first 7km as the flow dropped over boulders, creating pressure waves of 1.5 metres in height. Below this the river spread out and became braided, although it still flowed at a good speed. The lower river was prone to willow obstructions in the many braided river channels. Apart from the 7km down to Fork Stream confluence the trip was relatively straightforward and easy. The upper section contained good white water up to Grade 3 conditions depending on water levels.*

In 1989 a working party was established by the ECNZ as a forum for parties to state their concerns and aspirations in relation to the Waitaki Scheme. One party who expressed interest in, and become part of the Upper Waitaki Working Group, was the Otago Canoe

[147] Proposed Schedule One General Conditions 24 and 25.

[148] Tekapo Hydro Scheme Reconsenting Recreation Review, 2023. Prepared by Rob Greenaway & Associates, Page 23.

and Kayak Club Inc. The issue for the Otago Canoe and Kayak Club Inc related to the potential for recreational flows on the residual rivers.[149]

During the Upper Waitaki Working Group process, Mr Rekker, on behalf of Otago Canoe and Kayak Club Inc prepared an Assessment of Canoeing Opportunities.[150] This assessment concluded (amongst other matters) that:

a. Canoeists had suffered significant loss of recreational resource in the Southern Region due to various developments;

b. There are valuable sections for the re-establishment of scheduled releases being the Pūkaki River (offering exciting grade 3 whitewater for the first 2km), the Upper Tekapo River (offering grade 2 whitewater) and the Upper Ōhau River which also offers grade 2 whitewater;

c. The Upper Tekapo River offered good potential for whitewater enhancement;

d. Changes in canoeing had made grade 3 sections more attractive than lower grades and similar changes in competitive canoeing meant there was a need for more challenging whitewater and in the case of slalom, controlled flow; and

e. The Upper Waitaki Basin held the best opportunity in New Zealand for the New Zealand Canoeing Association to combine is national championships into one area.

Mr Rekker's recommendations were that an annual programme of controlled releases alongside water allocation in the Upper Tekapo and Pūkaki Rivers should be developed along with flushing flows in the Ōhau being co-ordinated with canoeing activities.

According to the minutes of the Upper Waitaki Working Group meetings the following relevant matters were considered:

a. On 13 July 1989 Mr Rekker, in relation to the Tekapo River, is recorded as follows: "*Interested in area 100m downstream of weir and dam for slalom site in spills – interest waning in Tekapo because of fisheries etc.*"[151] While a schedule of recreational use was proposed to be provided at the next meeting no record of that document can be found.

b. On 31 August 1989 after a planned spill the day before of 40 m^3/s allowing an evaluation of the Upper Tekapo, Mr Rekker is recorded as noting: "*Good River to*

[149] Volume 3 to ECNZ's 1990 water rights application, page 2.

[150] Volume 3 to ECNZ's 1990 water rights application, pages 45-46.

[151] Volume 3 to ECNZ's 1990 water rights application page 169.

canoe; Grade 2, comparable to Rangitata."[152] Mr France, from ECNZ, is also recorded as noting that "*Good site as loss to storage less significant*".[153]

c. On 28 March 1990 Mr Rekker is recorded as saying "*Upper Waitaki a valuable canoeing resource*."[154] An offer of 6 releases (at 40 m^3/s) was made by Mr France but rejected as not enough, with 26 releases (at 65 m^3/s) being sought by the Otago Canoe & Kayak Club.

6.7.2 Background to Previous Agreements and Current Consent Conditions

On 13 March 1990 ECNZ entered into an agreement with the New Zealand Canoeing Association Incorporated on matters that the parties agreed could not be formally included in the water rights sought by ECNZ. This agreement, in relation to the Upper Tekapo, stated:[155] "*Current rating Grade 2. Potential for nationally significant site with purpose built hydraulic engineering*" [the Tekapo White Water Course]. The agreement included:[156]

> *Enhancement of the Upper Tekapo River*
>
> *In recognition of the loss of recreational opportunity, particularly in the Pukaki River, the Electricity Corporation agrees to fund the cost of the enhancement [the Tekapo White Water Course] of parts of the Upper Tekapo River for white water recreation... .*

The Working Group's discussions also lead to an agreement between the numerous parties (including the NZ Canoeing Association Inc) dated 26 November 1990 (1990 Agreement) which related to provisions and conditions for ECNZ's water rights. Schedule 1, Part 1 to the 1990 Agreement provides a narrative to the working party agreement. Of relevance it records[157] that:

a. In relation to the Pūkaki River:

> *The New Zealand Canoeing Association (Inc) has identified a number of significant recreational opportunities in the Upper Waitaki. Traditionally the most important was the Pukaki River, particularly the first two kilometres below Lake Pukaki. The Canoeing Association and the Corporation have*

---

[152] Volume 3 to ECNZ's 1990 water rights application, page 172.

[153] Ibid.

[154] Volume 3 to ECNZ's 1990 water rights application, page 210. This aligns with the quote in Rob Greenaway & Associates 2023, page 23, from Egarr (1995) that "At present there is a half hour, grade II trip from the dam down to Lake Scott when water is released.".

[155] Volume 3 to ECNZ's 1990 water rights application, page 119.

[156] Volume 3 to ECNZ's 1990 water rights application, page 120.

[157] Volume 3 to ECNZ's 1990 water rights application, page 70.

agreed on a number of measures to recognise, restore and enhance these values where reasonably possible while recognising the national significance of the storage of the Upper Waitaki system for hydro generation of electricity.

b. In relation to the Tekapo River:

In further recognition of the value of recreational activities in the Upper Waitaki, the Electricity Corporation, has agreed to the inclusion of a condition on the right to dam Lake Tekapo, to provide for recreational spill flows in the Upper Tekapo River. The flows will provide significant white water opportunities in an area of the river where white water conditions will be further enhanced by engineering works to be carried out by the Canoeing Association and funded by the Electricity Corporation" [the Tekapo White Water Course].

This agreed position was then reflected in the Schedule A to the 1990 Agreement as proposed conditions (subsequently included in the water rights):

a. Condition 14:

The Canterbury Regional Council, upon application by or on behalf of the New Zealand Canoeing Association Inc. for recreational purposes may require the Grantee to release flows as measured immediately below the Lake Tekapo Control Structure as follows:

(i) Labour Weekend

Flows for at least 6 continuous hours each day between 8am and 5pm increasing to not less than 65 cumecs[158] *continuously for 4 hours out of the 6 hours total on the Saturday and Sunday and not less than 40 cumecs continuously for 4 hours on Monday and a flow of not less than 30 cumecs during the other hours.*

(ii) November and December

Flows on two weekends in each of November and December. The flows shall be for at least 6 continuous hours each day between 8am and 5pm with a continuous flow of not less than 40 cumecs for at least 4 hours on one day and a continuous flow of not less than 65 cumecs for at least 4 hours on the other day and a flow of not less than 30 cumecs during the other hours.

[158] 1 cumec = 1 cubic metre per second or 1 m^3/s.

(iii) January

Flow on one weekend in January. The flow shall be for at least 6 continuous hours each day between 8am and 5pm, with a flow of not less than 65 cumecs for at least 5 hours on one day, and a flow of not less than 40 cumecs for at least four hours on the other day, and a flow of not less than 30 cumecs during the other hours.

(iv) Flows on no more than 5 further days per year between 1 November and 31 January.

These flows shall be for at least 6 continuous hours per day between 8am and 5pm, with the flows on not more than 3 of the days being not less than 65 cumecs for 4 continuous hours of the 6, and on the others not less than 30 cumecs during the other hours.

(v) If the level of Lake Tekapo is below 704.5 on any of the agreed dates then the flows shall not be released and the scheduled flow release shall be rescheduled to any alternative days between 1 November and 31 January.

(vi) The dates for the flows specified in subclauses (i) to (iv) above shall be determined by the Canterbury Regional Council on application before 30 June in each year.

b. Condition 17:

The Canterbury Regional Council upon application by or on behalf of the New Zealand Canoeing Association Inc. for recreational purposes may require the Grantee to release flows as measured immediately below the Lake Pukaki Control Structure as follows:

(i) On one weekend annually between 1 November and 31 March following; the flows to be at or about 140 cumecs for at least 4 hours continuously between 10am and 4pm on each day of the weekend.

(ii) If in the opinion of the Grantee, hydraulic storage conditions do not enable the Grantee to meet the low requirements specified in sublease (i) above then the Grantee shall give notice to that effect to the Canterbury Regional Council and to the New Zealand Canoeing Association 14 days prior to the event, and the Canterbury Regional Council may after consultation defer the flow releases to an alternative date, or in an extremely dry year, cancel the event.

(iii) The Grantee shall take all steps to ensure that the recession of any other spill flows on the Pukaki River are managed to provide as many hours flow as possible at or about 140 cumecs.

(iv) The date for the flow specified in subclause (i) above shall be determined by the Canterbury Regional Council on application before 30 June in each year."

The 1990 Agreement proposed condition for Lake Tekapo Control Structure releases is presently reflected in condition 13 of resource consent CRC183551 (to dam the Takapō River) as follows:

The Grantee shall release the following flows, as measured immediately below the Lake Tekapo Control Structure, into the Tekapo River each year for the recreational purposes presented by the New Zealand Canoeing Association Incorporated, at the specified dates and times, unless the New Zealand Canoeing Association Incorporated does not require the releases:

a. Labour Weekend flows for at least six continuous hours each day between 8am and 5pm increasing to not less than 60 cumecs continuously for four hours out of the six-hour total on the Saturday and Sunday and not less than 40 cumecs continuously for four hours on Monday and a flow of not less than 30 cumecs during the other hours.

b. November and December Flows on two weekends in each November and December. The flows shall be for at least six continuous hours each day between 8am and 5pm, with a continuous flow of not less than 40 cumecs for at least four hours on one day, and a continuous flow of not less than 60 cumecs for at least four hours on the other day and a flow of not less than 30 cumecs during the other hours.

c. January Flow on one weekend in January. The flow shall be for at least 6 continuous hours each day between 8am and 5pm, with a flow of not less than 60 cumecs for at least five hours on one day, and a flow of not less than 40 cumecs for at least four hours on the other day, and a flow of not less than 30 cumecs during the other hours.

d. Flows on no more than five further days per year between 1 November and 31 January following: These flows shall be for at least six continuous hours per day, between 8am and 5pm, with the flows on not more than three of the days being not less than 60 cumecs for four continuous hours of the six, and on the others not less than 40 cumecs

for four continuous hours of the six and a flow of not less than 30 cumecs during the other hours.

PROVIDED THAT if the level of Lake Tekapo is below 704.5m on any of the specified dates then the flow shall not be released and the scheduled flow release shall be rescheduled to an alternative date between 1 November and 31 January, as determined by the Water Resources Manager, Canterbury Regional Council after discussion with the Grantee and the New Zealand Canoeing Association Incorporated. NOTE 1: The specified dates will be determined by the Water Resources Manager, Canterbury Regional Council before 30 June each year after discussion with the Grantee and the New Zealand Canoeing Association Incorporated.

The existing Tekapo PS consent requirement for whitewater recreation is that Genesis is to provide up to 18 days of flow annually with a total volume of 4,790 cumec hours[159] of release.

Releases in relation to the Pūkaki River, following on from proposed condition 17 in the 1990 agreement (above), are now managed by Meridian to mitigate the recreational effects of its operations.

In 2011 Genesis, Whitewater New Zealand Inc and the Tekapo Whitewater Trust ("**TWWT**") entered into an agreement in relation to the Tekapo PS where 2,863 cumec hours of water would be released for the whitewater course per year along with funding for the course. This arrangement was accepted by CRC.[160] The TWWT is a charitable trust with an objective:

... to benefit the public by providing, administering and maintaining public recreational and whitewater facilities in the Tekapo area for the canoeing disciplines of touring, down river racing and slalom including, but not limited to:

(i) Administering and managing the recreational whitewater course located near Lake George Scott, which uses water from Lake Tekapo, taken by diversion from the Tekapo River ("the Tekapo Course") as mitigation for loss of amenity to the paddling community for damming the Tekapo, Pūkaki and Ohau Rivers.

(ii) Providing equipment and other materials necessary for the health and safety of members of the public using the Tekapo course.

---

[159] 1 cumec hour = 1 cubic metre per second for 1 hour.

[160] CRC, via letter dated 4 August 2011, accepted that Genesis would follow this agreement rather than the specified consent condition in relation to releases.

(iii) To maintain the facilities associated with the Tekapo course including but not limited to aquatic animal and organism treatment areas, ablutions, car parking and landscaping.

(iv) Carrying out improvements to the Tekapo course and/or the associated facilities.

(v) Sponsoring and/or promoting public events at the Tekapo course. (vi) Providing training for those persons who operate the Tekapo course.

(vii) Monitoring any work required to deal with didymo or other aquatic animals or organisms or other contamination of the improvements comprising the Tekapo course, or water used in the Tekapo course.

6.7.3 Development of the Tekapo White Water Course and Further Agreements

In accordance with the ECNZ and New Zealand Canoeing Association Incorporated agreement a white water course was ultimately constructed. The Tekapo Whitewater Upgrade Trust was established in 1992 and was responsible "*for the planning, design and construction of facilities in the Tekapo river bed in order to upgrade that river to provide whitewater recreation for touring, downriver racing, and slalom by increasing the grade and diversity of white water features*."[161] After much design work,[162] the Tekapo White Water Course opened in 1998. Following the completion of the course, the Tekapo Whitewater Upgrade trust was wound up and in 2009 the TWWT was incorporated.

The Tekapo White Water Course (see Figure 43, photograph from the Tekapo White Water Course Facebook page) is nationally significant for whitewater kayaking,[163] is in part, of international standard, and a regularly hosts the Secondary School, South Island and national championships. It also provides wider recreational opportunities for other in-river users.[164]

---

[161] NZCanoeing_1997_3.pdf (whitewater.nz) – page 4.

[162] Ibid.

[163] Tekapo Hydro Scheme Reconsenting Recreation Review, 2023. Prepared by Rob Greenaway & Associates, page 5.

[164] Ibid, page 34 and Tekapo-dam-gates-release-torrent-for-white-water-sports (Stuff.co.nz).

Figure 43: The Tekapo White Water Course

RiverGuide[165] describes the course as follows:

> *The course starts with a riverwide hole immediately after the control gates. This is a great spot for playboating, with a large recirculating pool after it. After this is the first half of the course, which is considered grade 2, with one notable hole half way down and some fun eddies. After this the river opens out into a slow moving pool, a great spot for teaching. The second half of the course is considered closer to grade 3, beginning with a fantastic play hole. There is a large chute rapid, with a number of interesting eddies to catch on the way down. The courses concludes with a couple more play holes and a wave at the take out.*

With the opening of the Tekapo White Water Course the flow to be released into the Upper Tekapo River changed. The consented flows (between 60 and 30 cumecs) are too large for the course's operation. The course requires a flow of between 16 and 20 cumecs to operate. In this way the course was a win / win as it enabled an improved recreational use to occur at a lower flow (enabling more water to be used for generation).

[165] Riverguide.co.nz/all/kayaking/Tekapo.

Rob Greenaway & Associates 2023 provides[166] activity data from TWWT as to the use of the course from 2017-2020. In the 2012/2013 and 2013/2014 seasons days were restricted due to the canal relining work. Extra flows were provided in the 2020/2021 season and 5 days were carried forward from the 2021/2022 season to the 2022/23 season by agreement.[167]

6.7.4 Present Position and New Condition Proposed

As noted above, Genesis has reached agreement with Whitewater New Zealand Incorporated and the Tekapo Whitewater Trust for recreational water releases under the consent sought and agreed conditions[168] are included in the proposed conditions in Appendix D.

The proposed conditions are as follows:

> 22. *Subject to condition 23, Genesis must, at the request of Whitewater New Zealand Incorporated and the Tekapo Whitewater Trust, provide up to 4820 cumec hours to the Upper Tekapo River (between Gate 16 and Lake George Scott) annually between 1 July and 30 June for in-river recreation including, without limitation, white water canoeing, kayaking, rafting, sledging, and boarding.*
>
> 23. *The Consent Holders obligation to provide any particular requested recreational release shall not apply when any of the following applies:*
>
> *(i) Mechanical or system failures;*
>
> *(ii) Maintenance, repairs or upgrades, of the Tekapo Power Scheme;*
>
> *(iii) Extreme weather or other natural hazard events;*
>
> *(iv) Compliance with statutory requirements (including health and safety) and with the conditions of the Tekapo Consents (such as maintaining lake levels);*
>
> *(v) Operational demands within the electricity system such as requirements or restrictions on generation (including, but not limited to, Islanding as required by the National Grid operator);*
>
> *(vi) Requirements to meet security of supply if the South Island or New Zealand is below the Contingent Storage Alert Release Boundary*

---

[166] Tekapo Hydro Scheme Reconsenting Recreation Review, 2023. Prepared by Rob Greenaway & Associates, Table 2, page 23.

[167] This aligns with the 10-15 release weekend / events in Tekapo Hydro Scheme Reconsenting Recreation review, January 2023, page 34 and 10-12 recreational release weekends as stated in Tekapo-dam-gates-release-torrent-for-white-water-sports (Stuff.co.nz).

[168] Proposed Schedule One General Conditions 24 and 25.

established by the New Zealand electricity network System Operator (or other similar metric if it is replaced).

However, the Consent Holder shall use reasonable endeavours to supply water at a mutually agreed alternative date within the relevant year.

This proposed consent conditions:

a. Ensures the ongoing use of the nationally significant Tekapo White Water Course;

b. Provides a flow that enables the use of the course;

c. Reflects the use of the course and aligns with the present use of the course;

d. Ensures the efficient use of a nationally significant water resource (through use of the course rather than flows greater than the course can handle); and

e. Reflects the national importance of the water resource to New Zealand and in enabling Genesis' operations (see below).

Notwithstanding the above, flows from Takapō are essential to Genesis' national operations and renewable electricity generation. The importance of this water is explained in Concept 2025. The Tekapo PS provides flexible baseload generation. It is Genesis' only scheme in the South Island and flexibility of use is central to its national operations and supply to its customers. The ability to store water, time its release, and ramp up and down its release rate, provides significant importance for the national electricity system and allows Genesis to displace its thermal operations at Huntly. Provision of additional water from the Scheme would, in the interim until new generation is built elsewhere, result in the operation of Huntly with associated additional GHG emissions and additional costs to consumers. The agreement with Whitewater New Zealand Incorporated and the Tekapo Whitewater Trust represents an appropriate balance between the importance of water for electricity generation and the release of water for recreational purposes.

The proposed consent condition also reflects the effects of the Tekapo PS on in-river recreation on the Takapō River. As set out above:

a. For in river recreation, "*traditionally the most important was the Pūkaki River*"[169] with the Takapō (and the Ōhau) being less important;

b. The Tekapo White Water Course was established, and the original consent condition created, for the loss of recreational opportunity for the entire Upper Waitaki, particularly the Pūkaki River, and not just the Takapō River; and

[169] Volume 3 to ECNZ's 1990 water rights application, page 70.

c. The course now provides a nationally significant kayaking resource.

The proposed condition, ensuring the ongoing operation of the Tekapo White Water Course, more than mitigates the effects of the Tekapo PS on in-river recreation within the Takapō River. The course has become a nationally significant whitewater facility, and the proposed condition will ensure that its use continues.

6.8 FLOOD AND SPILL MANAGEMENT

Genesis has a comprehensive Dam Safety Management System ("**DSMS**") which has been developed in accordance with recommended industry practice found in the New Zealand Dam Safety Guidelines ("**NZDSG**"). An underlying principle of a DSMS is to identify and manage dam safety risks.

Modelling and analysis have been undertaken to identify potential dam safety risks within the Tekapo and Waitaki Power Schemes and to investigate potential modifications to the flood rules applicable to the schemes in order to mitigate against identified risks. These investigations identified that modification to the existing flood rules for Takapō would result in significant risk reduction for the structures, whilst not adversely impacting management of Takapō or the operating limits defined in the Waitaki Water Allocation Plan. Genesis is therefore considering changes to the present flood management rules for the Tekapo PS to address potential dam safety risks associated with the operation of Gate 16 during extreme flood events.

As noted in section 2.13, peak flows for the Tekapo PS are dominated by Takapō as this is the most significant source of flood inflows. The Takapō River is the natural outlet for Takapō, with outflows from the lake managed via the Lake Tekapo Control Structure (Gate 16). Management of flood events is focused on the operation of Gate 16 to provide safe passage of flood events through the system without presenting an undue risk to people, property, infrastructure (Genesis owned and otherwise), and the environment. Currently, Gate 16 is operated in accordance with a set of flood rules which set a minimum discharge from Takapō as a function of the lake level once it reaches MCL.

Gate 16 has a High Potential Impact Classification[170] ("**PIC**") under the NZDSG In accordance with the NZDSG recommended performance criteria, the adopted design inflow flood event is the PMF. Previous dam safety studies have identified potential dam safety deficiencies associated with the operation of Gate 16 during extreme flood events

[170] A dam's classification, termed its Potential Impact Classification (PIC), is purely a function of the consequences of a hypothetical failure breach or other uncontrolled release of the stored contents. It has no correlation with the probability of the dam failing or experiencing a dam safety incident (New Zealand Dam Safety Guidelines, 2015).

(i.e., the PMF), relating to potential damage to the structure during sustained high discharge rates at Gate 16 and the Lake George Scott Control Weir.

Genesis is considering refinements to the proposed flood rules, initially by assessing the effect of various operational and flood rule implementation options, taking into account implications across the full Combined Waitaki Hydro Scheme and how the Tekapo PS structures are operated during flood events. This includes assessing the implications of differing discharge rates in terms of lake levels and lake level changes and whether modifications to the present flood rules could be made to enable flood events to be managed in such a way as to more effectively provide safe passage of flows through Gate 16 and the Lake George Scott Weir.

The current Tekapo flood rules prescribe a minimum discharge from Takapō as a function of the lake level above MCL; as the lake level increases further above MCL the minimum discharge requirement increases. Any new flood rules would follow a similar principle to return the lake level to within operational limits post a flood event.

The proposed consent conditions for the Tekapo PS resource consents (Appendix D, conditions 3 – 16) require preparation and implementation of a High Flow Management Plan ("**HFMP**"). The purpose of the HFMP is to document how the flows via structures controlled by Genesis (namely the Tekapo Intake structure, Gate 16 (the Lake Tekapo Control Structure) on the outlet of Takapō, the Lake George Scott Weir, and Gate 17 to the Tekapo Canal) will be managed when the lake exceeds the MCL to protect the integrity of these structures, and to reduce the lake level back to MCL as soon as practicable.

Changes to the flood rules would not have any implications in terms of the WAP provisions for existing activities (i.e., changes to the flood rules will not change the RMA activity status for these applications) but will be a way to more effectively achieve the limits specified in the WAP during peak inflow events by providing for the safe passage of the PMF via Gate 16 and the Lake George Scott Control Weir during significant flood events.

The underlying principle for management of Takapō remains the same; as the lake level rises above the MCL, the minimum discharge from the lake progressively increases to the point at which the lake level peaks and then begins to decrease again. As the lake level falls, the minimum discharge progressively decreases, generally following the same flood rule curve as on the rising phase of a flood. The proposed change is to the flood rule curve that determines what the minimum discharge is for a given lake level above MCL.

With respect to effects on wetlands and other water bodies, Genesis notes that when Takapō levels rise, additional flows would pass down the Takapō River in the absence of the Tekapo PS. The proposed flood rules provide for management of flows when the

lake level rises above MCL, as with the existing rules. The modelling undertaken as part of the flood rules investigation assumes worst case scenario, i.e., that the lake is at MCL before any action is taken. The difference in the estimated peak lake levels between the existing and proposed flood rule curves are less than 0.3m for the range of historic and simulated events run up to, and including, the probable maximum flood.

The future flood rules would be incorporated into the proposed High Flow Management Plan under the consent conditions proposed in **Appendix D**.

6.9 DAM SAFETY

The dams forming part of the Tekapo PS are existing and are permitted activities under the CLWP. They also form part of the existing environment for the purposes of this application. While the current Tekapo PS consents include dam safety conditions, these conditions pre-date the current regulatory framework for dam safety in New Zealand.

In April 2021, Minister Williams (Building and Construction) advised Cabinet that "regional authorities should no longer attempt to regulate structural safety of dams using conditions of resource consents"[171] and that all matters related to dam safety should be regulated through the Building Act 2004 and not through resource consents under the RMA. Building (Dam Safety) Regulations 2022 were gazetted in May 2022 and come into force on 13 May 2024. These regulations set out the requirements for a dam safety assurance programme that must be implemented under the Building Act. It would be contrary to the intent behind the Regulations to regulate dam safety through resource consents and would have the potential to create inconsistencies that will be unmanageable for both Genesis and CRC.

All the Tekapo PS dams are subject to these Regulations, which require more onerous dam safety management and reporting than is currently required under the existing resource consents. The regulations address:

1. How the general requirements for dam safety assurance programmes have been met (regulation 11);
2. The procedures for the operation and maintenance of dams and reservoirs (regulation 12);
3. The surveillance procedures (regulation 13);
4. The procedures for the inspection and maintenance of appurtenant structures (regulation 14);

[171] Paragraph 54, Cabinet Paper: Dam Safety Regulations: Policy Proposals, April 2021, Dam Safety Regulations Policy Proposals.

5. The procedures for the inspection, maintenance, and testing of gate and valve systems with dam or reservoir safety functions (regulation 14);

6. The procedures for intermediate dam safety reviews (regulation 15);

7. The procedures for comprehensive dam safety reviews (regulation 16);

8. The procedures for emergency planning and response (regulation 17); and

9. The procedures for identifying and managing dam safety issues (regulation 18).

The resource consents sought by Genesis provide for the damming and passing of water through dams forming part of the Tekapo PS (including for spilling water and gate testing) as controlled under the RMA. However, the act of managing the safety and integrity of the dam structures themselves is not managed through the resource consents sought.

At present, Genesis undertakes dam safety reviews for the Tekapo PS structures in accordance with the existing resource consent conditions, which specify that such reviews be carried in accordance with the NZDSG. Comprehensive reviews are carried out by appropriately qualified people at 5 yearly intervals, with more limited reviews being carried out annually. The reports are provided to CRC as required by the existing consent conditions.

These reviews have shown that the Tekapo PS structures are safe, although from sometimes matters are identified that require remediation. Remediation actions are taken as required, such as the recent upgrade to the Tekapo Intake structure referred to in section 2.5 of this AEE and the proposed adjustments to the flood management rules discussed in section 6.8 of this AEE.

As the regulations governing dam safety matters have now changed and these matters are now specifically provided for in the regulations, it is no longer appropriate or necessary to address dam safety matters through resource consent conditions. Genesis will undertake dam safety assessments as required by and in accordance with the requirements of the Building (Dam Safety) Regulations 2022 as part of the ongoing operation of the Tekapo PS. This approach has been confirmed as appropriate by CRC.[172]

6.10 ONGOING MONITORING OF OPERATIONS AND EFFECTS

Genesis has proposed a suite of consent conditions in support of these applications, as set out in **Appendix D**. These conditions address:

1. Lake level management requirements;[173]

---

[172] Email S Karatau-Neeson (CRC) to J Page (Meridian), Wednesday, 8 March 2023.

[173] Proposed water permit conditions 6 – 9 and Schedule One General Conditions 1 – 16.

2. High flow management requirements;[174]

3. Sports fish salvage requirements;[175]

4. Recreational release flows;[176]

5. Implementation of an integrated Indigenous Biodiversity Enhancement Programme in conjunction with Meridian Energy Limited to improve the condition, resilience, indigenous biodiversity, ecological processes and other related values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment;[177]

6. Lakeshore erosion management to monitor the behaviour and characteristics of the shoreline of Takapō in response to the Tekapo Power Scheme operation;[178]

7. Reporting on the activities undertaken in accordance with the consent, including flow measurements, biodiversity enhancement implementation, high flow event management, recreational flow releases and maintenance undertaken;[179] and

8. Provision for review of the conditions of consent.[180]

Genesis will continue to measure lake levels, flows and climate data relevant to the operation of the Tekapo PS and to make this information publicly available. Water flow data as required by regulations will also be collected and provided to CRC.

6.11 CANTERBURY REGIONAL COUNCIL CONSENT CONDITION COMMENTS

CRC provided comment on the draft proposed conditions on 21 March 2025 (with a further clarification on 26 March 2025). Those comments have been taken into account in preparing the draft conditions in Appendix D.

General

The comments received recommended changes to the layout of the conditions, in particular with respect to defining the consent scope and moving conditions from the proposed Schedule One into the body of the individual consents sought. Those matters have been addressed in the proposed conditions in Appendix D to the extent considered appropriate. It is that the matters of "consent scope" are not considered to be "conditions

---

[174] Proposed Schedule One General Conditions 2 – 16.

[175] Proposed Schedule One General Conditions 17 – 23.

[176] Proposed Schedule One General Conditions 24 – 25.

[177] Draft Schedule One General Conditions 26 – 37.

[178] Proposed Schedule One General Condition 38.

[179] Proposed water permit conditions 8(b), 10 – 12 and Schedule One General Conditions 33, 36 and 39.

[180] Proposed water permit condition 9 and Schedule One General Conditions 41 – 43.

of consent"; rather, they are matters that prescribe what the consents are for and where the activities are located.

Several conditions have been retained in a proposed "Schedule One" to both the consents sought. These conditions relate to both the water and discharge permits sought rather than to the consents individually. Matters such as the lake levels identified in the Schedule One conditions are dependent on a range of factors including inflows, the volume of water taken for electricity generation and the rate at water is released (discharged) at Gate 16. Similarly, conditions relating to high flow management, sports fish salvage, recreational releases, environmental compensation, lakeshore erosion management and annual reporting are considered as being scheme operation-related rather than being individual consent specific.

Since these conditions apply to the scheme as a whole, the conditions have been retained in Schedule One to avoid duplication and confusion as to which conditions have precedence.

The CRC comments noted that the proposed condition 1 for each consent (referring to the application documents) is redundant in that the application forms part of the consent sought and doesn't need to be re-stated up front. They noted that they generally do not include such a condition. The proposed conditions in Appendix D retain a reference to the application to make it clear that the specific conditions proposed prevail over any general aspect covered in the application document.

Condition 3 in the proposed conditions in Appendix D for both the water and discharge permits sought requires the consent holder to comply with the consent conditions at all times "*except where an alternative operating regime is necessary in order to maintain the structural integrity and safety of any of the Tekapo Power Scheme or Waitaki Power Scheme infrastructure or public safety*". CRC considered this exception to be redundant, given both the provision for operating at low lake levels when an aggregate storage alert level is in operation (water permit condition 7) or emergency provisions under the RMA apply. The proposed condition 3 has been retained in the Appendix D conditions as it specifically gives effect to Policy 37 and Rule 3 (3) in the WAP:

> *By providing for the temporary lowering of Lakes Tekapo, Pūkaki and Ōhau where necessary for the purposes of maintenance or rehabilitation of electricity generation infrastructure* (Policy 37).
>
> *A temporary reduction in lake level below the minimum lake level specified in Table 4 for the purposes of maintenance or rehabilitation of electricity generation infrastructure is exempt from the minimum lake levels specified* (Rule 3 (3)).

The CRC comments noted that the proposed consent conditions do not define a flow regime for the Takapō River. As discussed in this application, the present flow regime in the Takapō River (primarily flows downstream of the Fork Stream confluence) forms part of the existing environment which these applications have been assessed against. The applications for consent are for continuation of the existing environment and status quo regime and any alteration to that existing regime will likely result in a reduction in flows available for electricity generation and therefore a reduction in generation output for both the Tekapo PS and Ōhau A, B and C stations downstream. No Takapō River flow regime definition in the proposed consent conditions is considered necessary.

CRC commented that there did not appear to be any diversion of water from Takapō so the "divert" aspects of the consents sought may not be necessary. Genesis confirms that "divert" has been included in the consents sought to ensure that all aspects of the movement of water associated with the operation of the Tekapo PS are included in the consents sought and that aspects such as the diversion of water by structures (which may in most cases be considered *de minimus* but nevertheless exist) are considered part of the consents.

With respect to proposed condition 7 for the water permit in Appendix D, CRC commented that rather than using the phrase "as soon as practicable" for advice to the Council, the wording should be before the lake level is reduced below the specified limit. Genesis considers that it will take time for the operating lake level to reduce below the relevant seasonal level in response to a contingent storage alert released by the system operator that will trigger this exercise of this condition. In such circumstances, all parties will be aware (through national media advice and water use warnings) that lake storage is low and a reduction in lake level can be expected to be required in order to maintain electricity supplies. In this instance "as soon as practicable" is appropriate and that, in any event, this is likely to occur well before lake levels fall below the relevant seasonal level specified in the consent conditions.

Flow Monitoring

Some adjustments were made to the conditions requiring monitoring of water flows under the consents sought in response to CRC comments regarding the conditions. Genesis notes that the water monitoring approach for the Tekapo PS uses both devices and systems to measure flows and that retrofitting of water "meters" for the means of verification of flow measurement is not viable or achievable for Tekapo A.

Rittmeyer flow sensors are used on all 3 penstocks to measure flows into the Tekapo A and B stations with an accuracy of approximately +/-0.5%, which is a much higher accuracy than the 5% stipulated by the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010. The flows recorded by the flow sensors are used in conjunction with "lookup" tables to represent the flow data for the Tekapo PS

control system and which is used as a verification should the primary sensors fail at any time.

In addition to the above, a differential pressure sensor that measures the pressure difference at two locations in the spiral casing around the runner of the Tekapo A turbine (scroll case) is used to derive a flow. The pressure differential data can be assessed to provide a separate flow for the station. A further flow sensor at the Tekapo A Intake provides another real time verification of the flow.

Gate 17 (which contributes to flows in the Tekapo Canal and to the Tekapo B station) has two hydraulic calculations to provide the operational and consented flow record depending on the operation of the Gate. A standard 'free flow' calculation is used when the Gate is clear of the water and another calculation is used for when the Gate is controlling the flow, known as "orifice" flow. These flows can also be viewed as a two-dimensional table across the flow full range. Inputs to the calculation are the Lake George Scott water level and the Gate position at Gate 17 and are similar to a typical stage to flow rating (for example, used for stream flow gauging). This relationship is two dimensional and is instead based on the relationship between stage/gate-position and flow. The relationship is unlikely to ever change as it is a fixed structure without sedimentation issues that can be associated with an open channel flow station.

The way Gate 17 flow has been verified in the past is through gaugings in the same way as an open channel flow station, undertaken upstream of the Gate structure or downstream in the Tekapo Canal, depending on operations at the time.

The above flow monitoring approach has previously been communicated with CRC monitoring staff and Genesis has commissioned data transfer software based on this approach to automatically update the CRC database every night.

Genesis considers that flow measurement verification methodologies (and associated reporting requirements) for Tekapo A are not required as there are numerous sets of more accurate data being collected in real time at the Tekapo A Power Station, replacing the need for annual or 5-yearly verifications.

Other Resource Consents

CRC noted that resource consent CRC950297.2 authorising the discharge of contaminants associated with the scheme expires in 5 years. Resource consents CRC950297.2 and CRC950298.2 authorise discharges from oil interceptors at Tekapo A and B stations respectively and are not related to the substantive water and discharge permits being sought under this application. Genesis is aware that these resource consents expire on 4 October 2030. The need for and the appropriateness of these resource consents and their associated conditions will be evaluated closer to their expiry date and replacement consents will be sought at that time if required.

Biodiversity Compensation

CRC provided a range of comments on the indigenous biodiversity compensation programme conditions offered by Genesis. As these conditions are proffered voluntarily and reflect agreements made with other parties (including the Department of Conservation, Waitaki Rūnaka and Meridian) no changes to the conditions have been made at this stage. The proposed integrated Indigenous Biodiversity Enhancement Programme is being undertaken to improve the condition, resilience, indigenous biodiversity, ecological processes and other related values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment, as described earlier in this assessment. As discussed, the programme is being prepared by ecologists and iwi representatives experienced in identifying the values, pressures, actions required and priorities for those actions in order to provide a lasting and comprehensive environmental enhancement for the Waitaki catchment.

Monitoring

CRC comments that measurements of groundwater should be undertaken and provided to the Council. In particular, they noted that observations of springs that occur as a result of seepage from the canal, especially along the unlined section of the canal next to the Tekapo River should be monitored and reported on and that there are a number of wetlands that surround Takapō, the Takapō River and the Tekapo Canal. Where groundwater provides a connection between lake levels, river flows or canal leakage that control wetland ecological functioning, CRC consider that groundwater monitoring should be undertaken.

The PDP 2025 report considers the effect of the Tekapo PS on groundwater and observes that:

1. Any seepages from the Tekapo Canal to groundwater and adjacent wetlands/water bodies are minor compared to the much larger natural water level variations (such as from rain/snow fall and seasonal fluctuations).

2. Some of the wetlands/water bodies surrounding Lake Takapō are influenced by lake level fluctuations, predominantly at the higher water levels, as a result of the scheme operation but this pattern of interaction will not be altered as a result of the reconsenting.

3. Rather than being affected by Tekapo Canal flows, wetlands such as the significant Patersons Ponds (adjacent to both the canal and Takapō River) appear to have a high hydraulic connection with the Takapō River rather than being influenced by canal seepages and that any canal seepage is unlikely to contribute much more than minor quantities of water to groundwater and surface water along the canal.

Overall, PDP 2025 concludes that while some interaction between the canal and the surrounding groundwater system is expected to continue with the on-going operation of the Tekapo PS, this is unlikely to change from the existing status quo.

Genesis uses power station flow data (collected as described above) to determine whether there are leakages occurring in the Tekapo Canal. If the operations team observe what they believe could be significant seepage from the canal they will contact the dam safety team who will then commission a diver team to enter the canal and look for seepage. If a suspected seepage point is identified, the divers will use a tracer at the suspected seepage point and check the surrounding area is checked for a discharge point. Routine groundwater monitoring is considered unlikely to effectively identify any effects of the Tekapo PS operation on groundwater or wetlands.

CRC also recommended inclusion of turbidity and water temperature measurements at a frequency not less than a 60-minute average at unspecified sites and for undertaking a LakeSPI survey of the aquatic macrophytes in Lake Tekapo every 3 years.

Cawthron 2025 reports that water quality in Takapō is excellent, with low concentrations of nutrients, minimal phytoplankton growth and high dissolved oxygen concentrations, even in the bottom waters of the lake. Water clarity in Lake Tekapo has historically been low, due to inputs of glacial 'flour' (glacial silt) from the tributaries but has increased in recent years, because of reductions of glacial flour within the rivers prior to entering the lake. Temperature, dissolved oxygen and turbidity measures were indicative of good water quality in every instance where measured.

The Cawthron 2025 report also observes that Increases in lake clarity over the past two decades have resulted in the Lake Submerged Plant Indicator (LakeSPI) improving by 38% between 2012 and 2017, while the maximum depth of aquatic plants has increased from 10.8 m to 21.3 m, meaning that macrophytes are now present in areas beyond the margins affected by lake level fluctuation resulting from the operation of the Tekapo PS. They conclude that previously reported adverse effects of the Tekapo PS on macrophytes in Takapō should continue to reduce over time if water clarity in the lake continues to increase.

The operation of the Tekapo PS does not affect turbidity, water temperature or LakeSPI. Conditions requiring ongoing monitoring of these would not be for any resource management purpose fairly or reasonably related to the resource consents sought (noting that section 108AA of the RMA requires a condition to be "directly connected" to an adverse effect of the activity on the environment and/or an applicable planning rule or environmental standard) and are not considered necessary.

7. RESOURCE MANAGEMENT ACT ASSESSMENT

As set out in Section 1 this application is made under the FTA. While the greatest weight must be applied to the purpose of the FTA, and the specific FTA requirements (both additional and restrictive) must be applied, the FTA largely refers out to the RMA. Therefore, this RMA assessment is required, and relevant FTA provisions are referenced as required.

7.1 RMA REQUIREMENTS FOR A CONSENT APPLICATION

Section 88 of the RMA requires that an application for a resource consent be made in the prescribed form and manner, and include, in accordance with Schedule 4, the information relating to the activity, including an assessment of the activity's effects on the environment, as required by Schedule 4. These requirements are superseded by the relevant sections in the FTA.

The resource consent applications are described in the prescribed form for FTA applications, as included with this application.

By way of summary, the AEE meets the FTA requirements. For completeness, the following is an assessment of the RMA provisions relevant to the resource consents sought.

7.2 RMA SECTION 104 ASSESSMENT

7.2.1 Introduction

Section 104(1) of the RMA lists the matters that the Panel must have regard to when considering an application for resource consent. As set out in sections 1.5.2 and 1.5.12, that is subservient to the purpose of the FTA.

Section 104(1) states:

> **104 Consideration of applications**
>
> (1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to–
>
> (a) any actual and potential effects on the environment of allowing the activity; and
>
> (ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and
>
> (b) any relevant provisions of
>
> (i) a national environmental standard:

(ii) other regulations:

(iii) a national policy statement:

(iv) a New Zealand coastal policy statement:

(v) a regional policy statement or proposed regional policy statement:

(vi) a plan or proposed plan; and

(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

Section 104 of the RMA does not give any of the matters to which the Panel is required to have regard primacy over any other matters. All the relevant matters are to be given such weight as the Panel sees fit in the circumstances and as directed by the relevant statutory planning documents. Furthermore, all the provisions are subject to sections 5, 6 and 7 of the RMA,[181] as discussed in section 7.3 of this assessment.

By way of summary, this application under the FTA is consistent with the matters for consideration under section 104 of the RMA. These matters are assessed in the sub-sections below.

7.2.2 Actual and Potential Effects

With respect to section 104(1)(a) of the RMA, the actual and potential effects on the environment associated with the ongoing operation of the Tekapo PS are set out in section 5 of this AEE and the relevant technical assessments appended to this AEE.

Overall, and based on the technical assessments that have been prepared, it is considered that the continued operation of the Tekapo PS will appropriately avoid, remedy or mitigate potential adverse effects on the environment. The assessments also demonstrate the positive effect that Project River Recovery has had on terrestrial invertebrates, lizards, water birds and vegetation.

In respect of alternatives, Schedule 4 of the RMA only requires a description of potential alternative locations or methods where the activity will result in any significant adverse effect on the environment. While section 5 of this AEE sets out that the ongoing operation of the Tekapo PS will not result in an any additional adverse effects, for completeness, it is noted that there is no feasible alternative location in which the activity can be undertaken, nor are there alternative methods by which a similar level of electricity generation from a renewable resource could be provided for at this location.[182]

---

[181] RMA section 8 is disapplied by the FTA.

[182] Note that minimum flows or other flow releases are not an “alternative method” but are mitigation options.

There are both functional and locational considerations in relation to the Tekapo PS that make an assessment of alternatives unnecessary from a technical perspective. Further, as the activity is already established, and has been for more than 70 years for Tekapo A, other alternative options will have new adverse effects over and above the continuation of the status quo. This is illustrated by the controlled activity nature of the status quo under the relevant Regional Plans, versus a higher level of consideration should changes be proposed.

7.2.3 Offset or Compensatory Measures Proposed

As detailed throughout this AEE, Genesis is proposing the continuation (and increase) of funding towards Project River Recovery (referred to as the indigenous biodiversity enhancement programme in this document) as part of this application. Section 104(1)(ab) requires regard to be had to any measure proposed or agreed to by Genesis for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity. As set out in section 1.5.2 above, any offset and compensation must be proposed by Genesis and cannot be imposed by the Panel.

The funding of the indigenous biodiversity enhancement programme has had substantial and tangible positive effects on the environment and will continue to do so in future, as detailed in the various assessments supporting this resource consent application. It was originally designed to compensate for the effects of the diversions associated with the WPS (including the Takapō River diversion) and it is considered that due to the issues associated with didymo in particular (which impact the ecology of the river), the continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environments including the wetlands within the Waitaki Catchment as proposed will continue to enhance the biodiversity in the vicinity of the Tekapo PS and appropriately compensates for the ongoing effects of the operation of the Tekapo PS.

As detailed in section 6 of this AEE, Genesis has proposed numerous other mitigation, offsetting and compensation measures including in relation to biodiversity enhancement, sports fishery and white-water kayaking.

7.2.4 Relevant Statutory Planning Documents

For the purpose of section 104(1)(b) of the RMA, the relevant statutory planning documents are considered to be:

1. National Policy Statement for Renewable Electricity Generation 2011;
2. National Policy Statement for Freshwater Management 2020;

3. Resource Management (National Environmental Standards for Freshwater) Regulations 2020;

4, Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007;

5. Resource Management (Measurement and Reporting of Water Takes) Regulations 2010;

6. Canterbury Regional Policy Statement;

7. Waitaki Catchment Water Allocation Regional Plan; and

8. Canterbury Land and Water Regional Plan.

Each of these policy statements and plans are considered further below.

7.2.5 Resource Management Regulations

7.2.5.1 Resource Management (National Environmental Standards for Freshwater) Regulations 2020

The Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (the "**Freshwater NES**") came into effect on 3 September 2020.

The various regulations in the Freshwater NES apply to resource consent applications that involve farming activities, the modification of natural inland wetlands, reclamation of rivers and the passage of fish affected by structures. The Freshwater NES is intended to increase regulatory consistency and certainty across New Zealand and ensure that any environmental effects of freshwater activities are appropriately managed.

Part 1 (Preliminary provisions) and Part 2 (Standards for farming activities) of the Freshwater NES do not contain any regulations that relate to the activities for which consent is sought for the Tekapo PS.

Part 3 of the Freshwater NES sets standards for "other activities" that relate to freshwater, including regulations relating to natural wetlands, reclamation of rivers and the passage of fish affected by structures.

Natural Inland Wetlands

A natural inland wetland under the Freshwater NES[183] means a wetland (as defined in the RMA) that is not:

(a) in the coastal marine area; or

[183] The Freshwater NES definition of a natural wetland is as defined in the NPSFM.

(b) a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland; or

(c) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or

(d) a geothermal wetland; or

(e) a wetland that:

(i) is within an area of pasture used for grazing; and

(ii) has vegetation cover comprising more than 50% exotic pasture species (as identified in the National List of Exotic Pasture Species using the Pasture Exclusion Assessment Methodology (see clause 1.8)); unless

(iii) the wetland is a location of a habitat of a threatened species identified under clause 3.8 of this National Policy Statement, in which case the exclusion in (e) does not apply.

As identified in the PDP (2021) report accompanying these applications, there are several wetlands located around the shores of Takapō that meet the NPSFM definition of a natural inland wetland.

Regulations 45, 46 and 47 relate to the construction, maintenance and operation of specified infrastructure.

Specified infrastructure is defined in the NPSFM as being (amongst other infrastructure) infrastructure that delivers a service operated by a lifeline utility as defined in the Civil Defence Emergency Management Act 2002 ("**CDEM Act**") or is regionally significant infrastructure identified as such in a regional policy statement or regional plan.

Schedule 1 of the CDEM Act identifies any entity that generates electricity for distribution through a network or distributes electricity through a network as being a lifeline utility, and the CRPS identifies the WPS as being both nationally and regionally significant.[184] The Tekapo PS is therefore specified infrastructure in terms of the Freshwater NES.

The consents sought for the Tekapo PS do not involve any new construction activities. Regulation 45 (construction of specified infrastructure) of the Freshwater NES is therefore not applicable to the applications.

Regulations 46 and 47 set out consent requirements for vegetation clearance, earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland or the taking, use, damming, diversion, or discharge of water within, or within a 100 m setback

[184] The CRPS definition for "Regionally Significant Infrastructure" includes "National, regional and local renewable electricity generation activities of any scale", the CRPS identified the "Waitaki Hydro Scheme" as being "nationally significant".

from, a natural inland wetland where that activity is for the purpose of maintaining or operating specified infrastructure.

None of the wetlands identified in the PDP (2021) report are located within 100 metres of the activities for which consent is sought. For example, while consent is sought to take water from Takapō, the location of the water take (being the Lake Tekapo Intake) is more than 100 metres from any of the wetlands identified.

There are also wetlands located in the Mackenzie Basin in the general vicinity of the Tekapo PS infrastructure. However, there are no natural inland wetlands (i.e., wetlands that are not constructed by artificial means, geothermal wetlands or areas of improved pasture dominated by exotic pasture species) within 100 metres of the activities for which consent is sought.

As there are no natural inland wetlands within 100 metres of the activities for which consent is sought the Freshwater NES regulations 46 and 47 (maintenance and operation of specified infrastructure and other infrastructure) are not applicable to this application.

Reclamation of Rivers

There are no activities associated with the reclamation of the bed of any rivers associated with the resource consent applications for the Tekapo PS, Regulation 57 (reclamation of the bed of any river) is therefore not applicable.

Passage of Fish Affected by Structures

The activities for which resource consents are sought for the Tekapo PS do not involve construction of any new structures such as culverts, weirs, flap gates, dams or fords. Regulation 60 states that subpart 3 of the Freshwater NES (which includes controls for the passage of fish affected by structures) does not apply to existing structures that were in a river or a connected area to the river at the close of 2 September 2020 or to any later alterations or extensions of that structure. In that regard, the continued use and maintenance of the existing structures associated with the Tekapo PS is not subject to subpart 3 of the Freshwater NES.

7.2.5.2 Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007

Regulations 7 and 8 of the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 apply to water and discharge permits issued by regional councils. However, due to the absence of any registered drinking water supplies that provide for no fewer than 25 people with drinking water for not less than 60 days each calendar year (Regulation 12) in the vicinity of the consents sought, this NES is not applicable.

7.2.5.3 Resource Management (Measurement and Reporting of Water Takes) Regulations 2010

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 (as amended in 2020[185]) regulations apply only to a water permit that allows water to be taken at a rate of 5 litres/second or more. However, the regulations do not apply to a water permit if the taking of water under the permit is non-consumptive in that (a) the same amount of water is returned to the same water body at or near the location from which it was taken; and (b) there is no significant delay between the taking and returning of the water.

The use of water for hydro-electricity generation for the Tekapo PS is a non-consumptive use (see for example *Lower Waitaki River Management Society Inc v Canterbury Regional Council* EnvC Christchurch C80/2009, 24 September 2009). Various guidance documents reach the same conclusion in relation to hydro-electricity generation.

Irrespective, Genesis already records, and will continue to record, appropriate flow rates and to provide the data to CRC as it does under the existing resource consents.

It is noted that the Tekapo A power station flow is measured using Rittmeyer penstock flow sensors. These 8 path acoustic sensors have been laser surveyed in and have a precision of approximately 0.5%. As the penstocks are buried, the penstock flow cannot be verified externally like other takes (such as for irrigation) where the pipeline is not buried.

The Winter Kennedy method is used to verify the Rittmeyer flow sensor real time measurements. This method is a widely used index testing approach (particularly for Kaplan turbines such as that installed at Tekapo A), which provides a relative or index value of the discharge that can be compared with the flow sensor measurements. Combined with this method, a lookup table of flow data derived from the Rittmeyer flow sensors is compared with Gross Head and station generation (MW) to verify the primary sensor data. This method provides a continual check on flows rather than relying on a spot check every now and then such as would be the case with canal flow gauging.

The Gate 17 flow is calculated with hydraulic flow equations using the Lake George Scott level and the Gate 17 position. There are two equations, one for when the gate is touching the water (orifice flow) and another for a typical free flow weir situation with the gate clear of the water (free flow). Validation of the calculation is done by flow gauging when the Lake George Scott weir is not in use and at steady state flow to provide the best fit to the data.

The combined Tekapo A power station flow and Gate 17 flow can be used to assess the Tekapo B power station flow.

---

[185] The Resource Management Measurement and Reporting of Water Takes Amendment Regulations 2020.

In addition, one off, ad-hoc Canal gaugings (spot checks with approximately 8% accuracy) are undertaken for Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 compliance.

Genesis advised Environment Canterbury of the methods used for measurement of flows for the Tekapo PS in 2019 and supplies flow data to Environment Canterbury in accordance with those methods.

7.2.6 National Policy Statements

7.2.6.1 National Policy Statement for Renewable Electricity Generation 2011

The National Policy Statement for Renewable Electricity Generation (the "**NPSREG**") came into effect on 13 May 2011. It addresses two major energy challenges as New Zealand seeks to meet its growing energy demand, including:

1. Responding to the risks of climate change by reducing GHG emissions caused by the production and use of energy; and

2. The delivery of a clean, secure and affordable energy while treating the environment responsibly.

Whilst the CRPS was promulgated after the NPSREG came into effect, it is appropriate to give consideration to the overarching directives of the NPSREG that are relevant to this resource consent application – before considering how these directives are manifest in the objectives, policies and rules that apply within the Canterbury Region.

The overarching objective of the NPSREG is:

> To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation.

It is clear that the Tekapo PS is nationally significant, and that its operation, maintenance and upgrading are required to be provided for.

Policies within the NPSREG that are relevant, include:

> **POLICY A**
>
> Decision-makers shall recognise and provide for the national significance of renewable electricity generation activities, including the national, regional and local benefits relevant to renewable electricity generation activities. These benefits include, but are not limited to:

a) maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions;

b) maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation;

c) using renewable natural resources rather than finite resources;

d) the reversibility of the adverse effects on the environment of some renewable electricity generation technologies;

e) avoiding reliance on imported fuels for the purposes of generating electricity.

POLICY B

Decision-makers shall have particular regard to the following matters:

a) maintenance of the generation output of existing renewable electricity generation activities can require protection of the assets, operational capacity and continued availability of the renewable energy resource; and

b) even minor reductions in the generation output of existing renewable electricity generation activities can cumulatively have significant adverse effects on national, regional and local renewable electricity generation output; and

c) meeting or exceeding the New Zealand Government's national target for the generation of electricity from renewable resources will require the significant development of renewable electricity generation activities.

POLICY C1

Decision-makers shall have particular regard to the following matters:

a) the need to locate the renewable electricity generation activity where the renewable energy resource is available;

b) logistical or technical practicalities associated with developing, upgrading, operating or maintaining the renewable electricity generation activity;

c) the location of existing structures and infrastructure including, but not limited to, roads, navigation and telecommunication structures and facilities, the distribution network and the national grid in relation to the renewable electricity generation activity, and the need to connect renewable electricity generation activity to the national grid;

d) designing measures which allow operational requirements to complement and provide for mitigation opportunities; and

e) adaptive management measures.

POLICY C2

When considering any residual environmental effects of renewable electricity generation activities that cannot be avoided, remedied or mitigated, decision-makers shall have regard to offsetting measures or environmental compensation

including measures or compensation which benefit the local environment and community affected.

POLICY D

Decision-makers shall, to the extent reasonably possible, manage activities to avoid reverse sensitivity effects on consented and on existing renewable electricity generation activities.

POLICY E2

Regional policy statements and regional and district plans shall include objectives, policies, and methods (including rules within plans) to provide for the development, operation, maintenance, and upgrading of new and existing hydro-electricity generation activities to the extent applicable to the region or district.

These applications are fundamentally consistent with the requirements of the NPSREG, for the following reasons:

1. This AEE has set out the significance of the Tekapo PS in terms of renewable electricity generation and hydro storage. Decision makers under the RMA are to recognise and provide for the benefits of the ongoing operation of the Tekapo PS;

2. Any reduction in baseload generation and storage from the Tekapo PS will diminish New Zealand's renewable electricity generation and would require significant development of alternative resources (with consequent environmental effects);

3. The Tekapo PS and the wider Waitaki Scheme are of national importance, and their operation are critical to achieving New Zealand's climate change aspirations, New Zealand's target to reduce net GHG emissions to 50 per cent below gross 2005 levels by 2030 as its Nationally Determined Contribution to international efforts to tackle climate change and the 90% renewable electricity target by 2025 that is set out in the present New Zealand Energy Efficiency and Conservation Strategy;

4. As detailed in section 1.4, the Tekapo PS forms part of the existing environment and there is potential that some of the effects of the construction of the Tekapo PS are irreversible;

5. Even minor reductions in the generation output of the Tekapo PS (i.e., through an allocation of water to other activities, or a continuous minimum flow requirement in the Takapō River) would have a significant effect on national, regional and local renewable electricity generation;[186] and

[186] The Concept 2025 report states (section 4.1, page 13) that due to the large benefits the scheme provides as a whole, it is likely that the benefits of a proportion of these services would also be significant.

6. The Tekapo PS is an existing activity that was constructed where the renewable energy resource is located.

It is noted that the Genesis indigenous biodiversity enhancement funding proposed is consistent with Policy C2 regarding environmental compensatory measures which benefit the local environment. Other mitigation, offsetting and compensatory measures proposed also fit within Policy C2.

Overall, the ongoing operation of the Tekapo PS is demonstrably consistent with the matters of national significance the NPSREG provides for and the objective of the NPSREG.

7.2.6.2 National Policy Statement for Freshwater Management 2020

The NPSFM came into force on 3 September 2020 and provides direction to local authorities and resource users regarding activities that affect the health of freshwater and sets out a national objective and various supporting policies for freshwater management under the RMA. The NPSFM has been amended several times, most recently in October 2024.

The NPSFM provides for the management of freshwater through the fundamental concept of Te Mana o te Wai. Te Mana o te Wai pervades the NPSFM and is relevant to all freshwater management, not just those aspects referred to in the NPSFM.

Freshwater must be managed in a way that gives effect to Te Mana o te Wai (Policy 1) and each regional council must give effect to Te Mana o te Wai (clause 3.2). Te Mana o te Wai refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai (water) and is about restoring and preserving the balance between the water, the wider environment, and the community.

The Resource Management (Freshwater and Other Matters) Amendment Act 2024 (the Amendment Act) amended sections 92, 104, and Schedule 4 of the RMA to exclude consideration of the hierarchy of obligations contained in clauses 1.3(5) and 2.1 of the NPSFM from resource consent applications, and from resource consent decisions.

Notwithstanding that exclusion, it is noted that the Treaty Impact Assessment prepared on behalf of Te Rūnanga o Moeraki, Te Rūnanga o Waihao and Te Rūnanga o Arowhenua for the Tekapo and Waitaki Power Schemes (**Appendix A**) sets out the approach taken by the Waitaki Rūnaka with respect to application of Te Mana o te Wai to these applications.

As set out in the Treaty Impact Assessment, Waitaki Rūnaka have recognised and balanced the significance of the waters of the Waitaki alongside the significance of the hydro electricity generation to the nation and are also cognisant of the importance of the Waitaki system as New Zealand responds to climate change. Adopting an

intergenerational approach to implementing Te Mana o te Wai recognises the scale of the challenge in the Waitaki and the need to start on a pathway.

The vision of Manawhenua in the medium to long term is to get water returned to the braided rivers of the Upper Waitaki, most notably the Takapō and Pūkaki Rivers. From a Manawhenua perspective, putting the river first will require flow regimes to mimic natural flow patterns. However, a minimum flow alone will not deliver Te Mana o te Wai and Manawhenua aspire to more than minimum flows and consider there is a risk that committing to minimum flows could undermine a return, in the future, to a river state sought by Manawhenua, hence the need for a longer-term perspective. There is also a risk perceived by Manawhenua that agencies and interests in the Waitaki could equate Te Mana o te Wai as being the reinstatement of flows to the Takapō and Pūkaki Rivers, with an assumption this is all that is necessary whereas to Manawhenua, a long term, holistic and encompassing catchment wide perspective is required.

The policies in the NPSFM are, to varying degrees, applicable to the replacement consents sought. These are considered below:

> **Policy 1:** Freshwater is managed in a way that gives effect to Te Mana o te Wai.

Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. Based on several comprehensive technical assessments commissioned by Genesis to assess the potential environmental effects associated with the continued operation of the Tekapo PS, the continued operation of the Tekapo PS will appropriately avoid, remedy or mitigate potential adverse effects on the environment. The assessments also demonstrate the positive effect that Project River Recovery has had on terrestrial invertebrates, lizards, water birds and vegetation. In addition, the activities for which consent is sought are controlled activities under the relevant plans demonstrating that the continued operation of the Tekapo PS will protect the health of freshwater in the area and will protect the health and well-being of the wider environment.

> **Policy 2:** Tāngata whenua are actively involved in freshwater management (including decision making processes), and Māori freshwater values are identified and provided for.

Policy 2 is primarily for regional councils to implement. However, Genesis has sought to engage with representatives of Ngāi Tahu and Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki throughout preparation of the resource consent applications for the Tekapo PS. Further detail is provided on this in sections 5.3 and 8 of this AEE.

> **Policy 3:** Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.

Genesis has sought to adopt an integrated approach to the assessment of the potential effects of the ongoing operation of the Tekapo PS and has worked as appropriate with Meridian to ensure that aspects relevant to the combined WPS can be managed safely but independently. This has included an assessment of the management of the damming, diversion, take, use and discharge of water by the Tekapo PS, including management of peak flow rates. Furthermore, the various technical assessments have focussed on how the operation of the Tekapo PS affects the full extent of the Takapō River – not just the residual reach of the river. The various agreements reached or in progress (for example, DoC, Fish and Game, Mackenzie District, whitewater rafting and kayaking) demonstrate the integrated approach being taken to mitigating the effects of the Tekapo PS.

> **Policy 4:** Freshwater is managed as part of New Zealand's integrated response to climate change

The ability to operate New Zealand's existing hydro-power schemes are fundamental to meeting the government's renewable electricity targets and our climate change commitments. Any reduction in the baseload generation output and storage within the Tekapo PS will need to be made up for by other power schemes; in the short term this is likely to be through thermal generation until alternative renewable generation could be consented and constructed (and a variety and greater output of such renewable schemes would be required to mitigate the effects of the lost baseload generation and storage).

> **Policy 5:** Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.

While it is for the CRC to establish a National Objectives Framework for waterbodies in the Canterbury Region, Genesis has sought to ensure that the condition framework for the management of the effects of the Tekapo PS addresses the potential for adverse effects in waterbodies that are potentially related to the operation of the Tekapo PS. In addition, Genesis is proposing the continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment to ensure that that the health and well-being of water bodies and freshwater ecosystems in the vicinity of the Tekapo PS is improved.

> **Policy 6:** There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.

The PDP 2023 assessment has confirmed that the ongoing operation of the Tekapo PS will not result in a loss of extent of natural inland wetlands. The values of existing wetlands will be unaffected as there is no proposed change to the existing operating regime. In addition, the proposal to continue and increase funding for an indigenous biodiversity

enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment as proposed will continue to enhance the biodiversity in the vicinity of the Tekapo PS and will provide continuing opportunities for the restoration of natural inland wetlands.

Policy 7: The loss of river extent and values is avoided to the extent practicable

Construction of the Tekapo PS had a significant effect on the value of the first 7 km of the Takapō River. However, the Tekapo PS diversion has occurred for over 70 years (for Tekapo A, and over 40 years for Tekapo B) and the ongoing effects of the operation of Tekapo PS forms part of the existing environment. The ongoing operation of the Tekapo PS will not result in any further loss of extent or values of the Takapō River; rather, the granting of these consent applications as sought will maintain the current extent and values. As explained in the AEE above, some of these effects, such as improved water clarity, are positive and many of the adverse effects are entwined with the arrival of didymo in 2007 (which was not associated with the Tekapo PS). Flushing flows would have only short-term benefits in didymo reduction before it quickly recolonised, while low, stable flows support didymo growth. Some of these values, such as angling, have been mitigated, or enhanced to a greater level through the ongoing operation of the Tekapo Canal.

The reduction of effects is to 'the extent practicable'. Given the effects on generation of electricity from renewable energy from minimum and flushing flows, and the national significance of that generation, especially in helping to decarbonise Aotearoa New Zealand's economy, it is not practical to alter the current operation. Such an outcome would also be an inefficient use of a national significant physical resource.

Policy 8: The significant values of outstanding water bodies are protected.

The Tekapo PS will not affect any identified outstanding waterbodies.

Policy 9: The habitats of indigenous freshwater species are protected.

Genesis is not proposing any changes to the operation of the Tekapo PS that will result in effects on existing habitats of indigenous freshwater species. The continuation of and increased funding for an indigenous biodiversity enhancement programme will work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environments including the wetlands within the Waitaki Catchment. As proposed, this programme will continue to enhance the indigenous biodiversity in the vicinity of the Tekapo PS to ensure that existing habitats of indigenous freshwater species are protected and enhanced.

> **Policy 10:** The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.

Genesis will not alter the habitat available for trout as part of this resource consent application. The current operations are proposed to continue. The Tekapo Canal is a nationally significant (and internationally recognised) salmonid fishery and the Takapō River, despite a significant reduction in activity since the arrival of didymo in 2007, also remains a significant fishery in Aotearoa New Zealand.

> **Policy 11:** Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided

The diversion, take and use of water for the Tekapo PS is an efficient use of water. Genesis seeks to maximise the use of water for the generation of electricity, subject to the capacity of the infrastructure in place. Genesis has recently completed works (such as upgrades to the turbines in Tekapo B) to ensure that its use of water is efficient. The same applies to lining of parts of the Tekapo canal to reduce loss to seepage.

> **Policy 13:** The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.

> **Policy 14:** Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.

Genesis will continue to monitor the waterbodies involved in the operation of the Tekapo PS.

> **Policy 15:** Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

The ongoing operation of the Tekapo PS provides for the social and economic wellbeing of communities both in terms of providing recreational benefits as well as through providing a significant contribution to New Zealand's renewable electricity generation portfolio.

Part 3 of the NPSFM sets out a "non-exhaustive" list of things that **local authorities** must do to give effect to the objective and policies of the NPSFM. These include:

a. Engaging with communities and tāngata whenua to determine how Te Mana o te Wai applies to waterbodies and freshwater ecosystems in the region;

b. Develop long term visions for freshwater in the region and including these visions as objectives in the applicable regional policy statement;

c. Involving tāngata whenua;

d. Adopting an integrated approach, recognising the interconnectedness of the whole environment;

e. Follow the national objectives framework process to identify freshwater management units ("**FMU**"), identify values for each FMU, set environmental outcomes for each identified value, target attribute states, environmental flows and levels, and other criteria to support the achievement of environmental outcomes and set limits and rules; and

f. Undertake monitoring and assess trends.

Of relevance to these applications, clause 3.31 applies to the Tekapo PS (which forms part of the WPS, which is a listed scheme). This clause requires that, when implementing any part of the NPSFM (and where affected by a listed hydro-scheme), a regional council must have regard to the importance of the hydro-schemes:

1. Contribution to meeting New Zealand's GHG emission targets;

2. Contribution to maintaining the security of New Zealand's electricity supply; and

3. Generation capacity, storage, and operational flexibility.

Clause 3.31 enables the regional council to set an attribute state below the national bottom line (where it is impacted by a listed hydro-scheme), but the regional council must still, set the target attribute state to achieve an improved attribute state to the extent practicable without having a significant adverse effect on the scheme.

It is noted that both the CLWRP and WAP cannot be said to give effect to the NPSFM, simply because of the timing of the NPSFM and when the WAP and CLWRP were made operative. However, the NPSFM sets out a process and timing for giving effect to the NPSFM "as soon as reasonably practicable" (section 4.1 of the NPSFM) through regional policy statements and regional plans. The NPSFM does not anticipate that plans will be changed immediately to give effect to the policy statement, nor does it require decision making on resource consent applications to cease while plans are amended to give effect to the policy statement.

The NPSFM is not intended to prevent applications such as that made by Genesis being granted (and lawfully, as a controlled activity it could not); indeed, with respect to the first priority in the NPSFM objective, the generation of electricity from a renewable resource that avoids contributing to GHG emissions and helps avoid climate change effects prioritises the health and well-being of water bodies and freshwater ecosystems that would otherwise be adversely affected by GHG emissions. The second priority in the NPSFM objective following the health and well-being of water bodies and freshwater ecosystems, is the health needs of people. Renewable electricity is fundamental to the health needs of people in many ways, such as providing electricity to run hospitals or to run water

treatment plants and pumping systems to provide drinking water. The continued operation of the Tekapo PS will protect the health of freshwater in the area and will protect the health and well-being of the wider environment. The third priority is the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future. Renewable electricity is also fundamental to community wellbeing and enabling Aotearoa New Zealand to decarbonise its economy. The Tekapo PS generates substantial volumes of 100% renewable electricity, with an average annual output (from both direct and indirect generation) sufficient to supply approximately 228,000 Canterbury households.

In addition to its contribution to national electricity supply, the Tekapo PS provides power to consumers in the Tekapo Albury region when that area is periodically cut-off from the rest of the grid. Without the Tekapo A station, an alternative electricity source would need to be developed as a local back-up.

While it is acknowledged that the operation of the Tekapo PS may not be consistent with each and every provision of the NPSFM, particularly in respect of the lack of minimum flows in the Takapō River, the NPSFM recognises that there are ongoing impacts of hydro schemes on freshwater bodies where a balancing exercise is required to reconcile the need for renewable electricity and to maintain the values of waterbodies (through the inclusion of clause 3.31 in the NPSFM).[187] The diversion of water from the Takapō River by the Tekapo PS (where that water is utilised by five power stations, as well as being stored in Lake Pūkaki) has occurred for many decades and forms part of the existing environment. Any requirement to implement an alternative flow regime, or lake level operating regime, could have a significant effect on the electricity system and in achieving New Zealand's climate change aspirations.

The proposed continuation of and increased funding for biodiversity enhancement ensures that waterbodies can continue to provide important habitat for indigenous biodiversity. As the technical assessments demonstrate, the ecology of the Takapō River is compromised by didymo so it may not be able to provide high quality habitat even with a minimum flow. The continuation of, and increased funding for, an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment as proposed will continue to enhance the biodiversity in the vicinity of the Tekapo PS. This will appropriately

[187] Clause 3.31 relates to the Waikato, Tongariro, Waitaki (including the Tekapo PS), Manapouri and Clutha hydro-electricity generation schemes and requires that when implementing any part of the National Policy Statement as it applies to a freshwater management unit affected by a Scheme, a regional council must have regard to the importance of the Scheme's contribution to meeting New Zealand's greenhouse gas emission targets, its contribution to maintaining the security of New Zealand's electricity supply and its generation capacity, storage, and operational flexibility.

mitigate, offset and compensate for the ongoing effects of the historical, and current, diversion of water from the Takapō River.

Overall, and with the proposed conditions of consent and the proposed continuation of, and increased funding for, an indigenous biodiversity enhancement programme within the Waitaki Catchment will continue to enhance the biodiversity in the vicinity of the Tekapo PS and means that the ongoing operation of the Tekapo PS is consistent with the objective and policies of the NPSFM. It provides an example of how the NPSFM can be implemented in practice to provide for a significant and nationally important water use activity while ensuring that the health and wellbeing of the Waitaki catchment freshwater ecosystems are prioritised and protected (particularly upstream of the Tekapo PS), the health needs of people are provided for and people and communities are able to provide for their social, economic, and cultural wellbeing.

7.2.6.3 National Policy Statement for Indigenous Biodiversity 2023

The National Policy Statement for Indigenous Biodiversity 2023 ("**NPSIB**") was approved by the Governor General on 31 May 2023 and came into force on 4 August 2023.

The objective of the NPSIB is:

> (a) To maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity after the commencement date; and
>
> (b) To achieve this:
>
> (i) Through recognising the mana of tangata whenua as kaitiaki of indigenous biodiversity; and
>
> (ii) By recognising people and communities, including landowners, as stewards of indigenous biodiversity; and
>
> (iii) By protecting and restoring indigenous biodiversity as necessary to achieve the overall maintenance of indigenous biodiversity; and
>
> (iv) While providing for the social, economic, and cultural wellbeing of people and communities now and in the future.

The resource consents sought for the Tekapo PS are for the continued operation of the scheme. No changes to the operating regime (other than a small change with respect to flood flow management) are proposed. As part of the application, an agreement with has been reached with Meridian and DoC to implement an indigenous biodiversity enhancement programme focussing on improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment. This indigenous biodiversity enhancement programme will give effect to the objective of the NPSIB.

Notwithstanding the above, paragraph 3 of section 1.3 "Application" of Part 1 of the NPSIB states as follows:

> Nothing in this National Policy Statement applies to the development, operation, maintenance or upgrade of renewable electricity generation assets and activities and electricity transmission network assets and activities. For the avoidance of doubt, renewable electricity generation assets and activities, and electricity transmission network assets and activities, are not "specified infrastructure" for the purposes of this National Policy Statement.

The Tekapo PS is a renewable electricity generation asset and activity and in terms of paragraph 3, the NPSIB does not apply. For that reason, the NPSIB has not been considered further in this AEE.

7.2.7 Canterbury Regional Policy Statement

The CRPS became operative on 15 January 2013 and provides an overview of the significant resource management issues in the Canterbury region, and the objectives, policies and methods to achieve integrated management of natural and physical resources.

The analysis in this section of this AEE focusses on the most relevant objectives and policies of the CRPS. The full suite of all relevant provisions is contained in **Appendix T**.

Issues

The RPS sets out regionally significant resource management issues and/or issues of significance to iwi authorities of the region headed as follows:

a. Issues of Resource Management Significant to Ngāi Tahu;

b. Land Use and Infrastructure;

c. Recovery and Rebuilding of Greater Christchurch;

d. Freshwater;

e. The Coastal Environment;

f. Ecosystems and Indigenous Biodiversity;

g. Beds of Rivers and Lakes and their Riparian Zones;

h. Natural Hazards;

i. Landscape;

j. Historic Heritage;

k. Air Quality;

l. Soils;

m. Energy;

n. Contaminated Land;

o. Hazardous Substances; and

p. Waste Minimisation and Management.

Most of these issues are, to varying degrees, relevant to the reconsenting of the Tekapo PS.

The objectives and policies in the RPS that seek to address the issues listed above relevant to the resource consent applications for the proposed activities associated with the ongoing operation of the Tekapo PS are discussed more fully in **Appendix T** and are summarised below.

The "Issues of Resource Management Significance to Ngāi Tahu" chapter of the CRPS sets out the resource management issues of significance to Ngāi Tahu, the tāngata whenua of the Canterbury region, and acknowledges Ngāi Tahu as a Te Tiriti o Waitangi partner.

There are no specific objectives and policies in this chapter, with the plan stating that the "*approach adopted in the CRPS is to integrate issues of significance to Ngāi Tahu throughout the document, and ensure that policies resolve issues and achieve outcomes consistent with those desired by Ngāi Tahu*". Key issues for tāngata whenua include those in relation to land use and infrastructure, freshwater (including an outcome sought being the establishment of sustainable environmental flow regimes), biodiversity (including outcomes seeking the protection of native fish habitat and spawning areas from adverse effects associated with damming, diversion, water abstractions and discharges to water), and energy. These matters are addressed in **Appendix T** of this AEE.

The continuation of existing hydro-electric power schemes is specifically recognised and provided for within the CRPS and to that extent, the resource management issues of significance to Ngāi Tahu with respect to the Tekapo PS have been addressed in the CRPS as a whole.

Objectives and Policies

The RPS sets out objectives to address the issues identified in the RPS. The objectives identify the desired end state of the region's natural and physical resources. The introduction to the RPS states that in many instances the desired end states are enduring targets and will take longer than the life of the RPS to be achieved.

The approach taken to these replacement resource consent applications includes consideration of the significance of natural and physical resources in the vicinity of the Tekapo PS and includes measures to mitigate those effects (including the proposed continuation and increase in funding to DoC for an indigenous biodiversity enhancement

programme). The continued operation of the Tekapo PS has significant environmental, social and economic benefits, and the effects of its operation can be appropriately managed.

The CRPS provides for the continued operation and maintenance of regionally significant infrastructure and recognises that some activities, such as hydro-electricity generation, can only occur where the natural or physical resource exists (referred to has having logistical, technical or operational constraints). The Tekapo PS can only occur where the hydrological resource exists and has formed part of the environment for many decades. The construction of Tekapo PS substantially modified the environment at the time. However, the technical assessments supporting these resource consent applications have assessed the ongoing effects of the Tekapo PS and conclude that the operation will sustain the existing values of the environment and will not have any more than minor adverse effects on significant values.

The freshwater provisions in the CRPS do not restrict the continued operation, maintenance or upgrading of an existing hydro-generation scheme provided they remain of a similar scale, intensity and character, and do not result on any additional significant effects beyond those that have already occurred on the natural characteristics of a river or lake. Reconsenting the Tekapo PS as proposed is consistent with this approach, where Genesis is not proposing any changes to the operation of the Tekapo PS that would affect the existing natural character values of the environment or that result in a change in scale, intensity or character of the activity or its effects. The continuation and increase in funding to DoC for an indigenous biodiversity enhancement programme for improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment, as proffered by Genesis, focusses on restoring areas of significant indigenous vegetation and significant habitats (including wetlands), including aspects such as pest control.

The CRPS sets out how environmental flow regimes and how water is to be allocated to activities. For completeness, it is noted that the WAP sets out the environmental flow regimes and water allocation regimes applicable to the Waitaki Catchment and that the consents as sought will not result in any change to those environmental flow regimes and water allocation regimes.

Policy 7.3.11 explicitly recognises and provides for the continuation of the Tekapo PS, stating:

> **Policy 7.3.11: Existing activities and infrastructure**
>
> In relation to existing activities and infrastructure:

1. to recognise and provide for the continuation of existing hydro-electricity generation and irrigation schemes, and other activities which involve substantial investment in infrastructure; but

2. require improvements in water use efficiency and reductions in adverse environmental effects of these activities, where appropriate.

As set out in the AEE above Genesis' ongoing upgrades to the Tekapo PS, including canal lining and turbine upgrades, ensures the efficient use of the water passing through the scheme.

Within the biodiversity section of the CRPS, the objectives and policies require the protection of areas identified as significant to ensure no net loss of indigenous biodiversity or indigenous biodiversity values as a result of land use activities. The continued operation of the Tekapo PS as proposed will not result in additional effects on indigenous biodiversity. In that regard, existing biodiversity will be maintained; however, the continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment as proposed will continue to enhance the biodiversity in the vicinity of the Tekapo PS. The technical assessments supporting this AEE demonstrate the tangible benefits works associated with Project River Recovery have had on terrestrial invertebrates, lizards, waterbirds and vegetation, the proposed indigenous biodiversity enhancement programme will continue and enhance this.

It is noted that the Tekapo River is the least modified of the three lake-fed, large, braided rivers in the area, the other two being Pūkaki and Ōhau rivers. The Tekapo River retains habitat for native fish; however, the river is modified by a range of factors including flow regime changes, effects of introduced species and alterations caused by river channel and riparian management. Notwithstanding this, the Takapō River has some significance because it is the least modified of its type in the area.

Genesis is not proposing to alter the operation of the Tekapo PS and in that regard, there will be no additional effects on the exiting values of the beds of rivers or lakes, or their riparian zones.

With respect to natural hazards, the Tekapo PS infrastructure is designed to specific criteria and standards to limit the effects of flood events or seismic events on this infrastructure and is maintained and continually assessed against performance criteria. Upgrades have been undertaken to ensure that the Tekapo PS structures meet the required standards. This is discussed in section 6.9 of this AEE.

The assessment of landscapes, including natural character and amenity undertaken for this application concludes that there will be no additional effects of the ongoing operation

of the Tekapo PS on the values and characteristics of the various waterbodies and landscapes.

It is also noted that the MDP (which implements the CRPS direction in respect of outstanding landscapes), recognises the WPS as being part of the Mackenzie Basin outstanding natural landscape.[188]

The objectives and policies of the Historic Heritage chapter of the CRPS relate to the identification and protection of historical heritage and cultural heritage. Genesis acknowledges the importance of Takapō, Lake Pūkaki, the Takapō River and the wider environment to Ngāi Tahu and has sought to engage with Ngāi Tahu to understand these values in greater detail. Genesis also considers that because lake level and river flow fluctuations have been occurring since the 1970's (and to a lesser extent since Tekapo A was commissioned in 1951) due to Tekapo PS operations, exposure of new cultural or heritage sites is unlikely to occur in future.

The provisions of the energy chapter seek to reduce the dependence on non-sustainable energy sources, promote the use of energy from renewable sources and to enable existing hydro-electricity generation infrastructure to be maintained, upgraded and enhanced. The provisions set out a framework whereby adverse effects on significant natural and physical resources and cultural values are to be avoided as a first priority and where avoidance is not practicable, remediation and mitigation are appropriate. For all other effects, the direction is to appropriately "control" them.

The Tekapo PS applications seek to replace consents for the water and discharge related aspects for a renewable electricity generation activity that can only be located in and around water. In that regard, the mitigation measures set out in this AEE and the proposed conditions of consent will ensure that effects on the environment of the ongoing operation of the Tekapo PS are appropriately managed and that the benefit of renewable electricity generation through the scheme is recognised.

It is considered that the ongoing operation of the Tekapo PS is consistent with (and is not in conflict with) the objectives and policies of the CRPS.

7.2.8 Waitaki Catchment Water Allocation Regional Plan (WAP)

The WAP was developed under the provisions of the Resource Management (Waitaki Catchment) Amendment Act 2004 (the "**Waitaki Act**"). The Waitaki Act aimed to improve decision-making in respect of water allocation in the Waitaki catchment and created an

[188] For example, Rural Objective 3B – Activities in the Mackenzie Basin's outstanding natural landscape (to maintain and develop structures and works for the Waitaki Power Scheme), Policy 3B6 – Lakeside Protection Areas (to provide for the upgrading maintenance and enhancement of the existing elements of the Waitaki Power Scheme).

independent Waitaki Catchment Water Allocation Board ("**Board**"). The Board was charged with developing a regional plan to guide water allocation in the Waitaki catchment. It was given all the powers that a regional council would have to develop the plan.

The WAP was adopted by the Board in September 2005[189] and the Board was disbanded. The plan applies to 'the taking, use, damming or diverting of water from water bodies within the Waitaki catchment'. The WAP sets out policies to guide decision making under the plan, identifying particular water bodies which have high natural character, providing that environmental flows should be established for all rivers in the catchment, and prohibiting the abstraction of water where flows have reached their minimum level. Extraction of any water is prohibited from specific water bodies. The plan does not address water quality.

Section 28 of the Waitaki Act sets out the effect of the WAP on regional policy statements and regional plans. It states that the provisions of the WAP prevail if they are inconsistent with a regional policy statement or regional plan that applies to any part of the Waitaki catchment.

Given that the Tekapo PS activities are primarily controlled through the WAP, the full suite of all the provisions in the WAP is contained in **Appendix T** along with an assessment of each. The analysis in this section of this AEE summarises the most relevant objectives and policies of the WAP.

The framing of the five overarching objectives in the WAP mean that Objective 1 is the priority and is considered to be generally consistent with the concept of Te Mana o Te Wai (discussed in respect of the NPSFM) where this objective largely prioritises the health of the water first. The WAP objectives and policies are that where consistent with Objective 1, water should be provided for a variety of social and economic uses including for hydro-electricity generation (Objective 2). Objective 3 then sets out that allocation of water in the Waitaki catchment should recognise the benefits and adverse effects of the environment resulting from the taking of water, and the costs and benefits (at the national and local scale) of using water (however, the objective does not give weighting to national costs and benefits higher than is given to local costs and benefits). This is particularly applicable to the Tekapo PS where the benefits are accrued at the local and national scale, but the adverse effects of the ongoing operation of the scheme are at the local level.

While it is acknowledged that the diversion of water associated with the generation of the electricity by the Tekapo PS from the Takapō River does not provide for a direct connection from mountains to the sea for the river, when developing and making decisions on the WAP, this matter was addressed in some detail. The Board found that the effects on

[189] Waitaki Catchment Water Allocation Regional Plan, Annex 1, Decision and principal reasons for adopting the Plan provisions, Prepared by the Waitaki Catchment Water Allocation Board, September 2005, https://environment.govt.nz/assets/Publications/Files/Waitaki-Catchment-Water-Allocation-Regional-Plan-Annex-1-Decision-and-principal-reasons-for-adopting-the-Plan-provisions.pdf.

electricity generation as a result of water released directly from Takapō into the upper Takapō River to achieve a continuity of flow from the mountains to the sea outweighed the benefits.[190] The rule framework of the WAP (discussed below) does not require a continuous minimum flow to be released downstream of the Lake Tekapo Control Structure (Gate 16) or the Lake George Scott Weir, although the Tekapo PS does not result in water being diverted out of the Waitaki Catchment and that flow from Takapō does flow from the mountains to the sea via the Waitaki Catchment.

Genesis is not seeking resource consents to take, use, dam or divert water from any High Natural Character Waterbodies identified in Policy 2, which include:

1. The tributaries of Takapō but does not include the Takapō River;
2. Mainstems and tributaries of Fork Stream, Irishman Creek and Mary Burn, upstream of Braemar Road;
3. Wetlands with a moderate or higher significance throughout the catchment; and
4. Lakes Alexandrina (located adjacent to Takapō) and McGregor and their tributaries and other lakes upstream of Lakes Takapō and Pūkaki.

The resource consents sought for the Tekapo PS provide for the continued operation of the Tekapo PS in accordance with environmental flow and level regimes set through the policies in the WAP. Granting the resource consents sought for the Tekapo PS as proposed would provide for the continued operation of the Tekapo PS and would:

a. Have regard to the likely national and local effects of the Tekapo PS consents;
b. Take account of the relevant national, regional and local plans and strategies;
c. Recognise the nature of Takapō;
d. Recognise the importance of Takapō, its associated infrastructure and the WPS infrastructure downstream of the Tekapo PS to New Zealand's electricity system;
e. Take account of the environmental effects of the Tekapo PS activities on landscape, water quality, and the beds of lakes and rivers;
f. Provide for a high level of efficacy and technical efficiency; and
g. Not result in water being exported from the Waitaki catchment.

In particular, the resource consents sought for the Tekapo PS provide for:

[190] Paragraph 133 of the Waitaki Catchment Water Allocation Board Decision and principal reasons for adopting the Plan provisions, September 2005.

1. Minimum lake levels for Takapō which are the same as that provided for under the existing resource consents and is not sought to be changed;

2. An extreme minimum lake level in Takapō from October to March during a national power shortage as identified by reference to the Electricity Commission's second (emergency) zone, which is the same as that provided for under the existing resource consents and is not sought to be changed; and

3. No minimum flow requirement in the Takapō River directly below Takapō, in accordance with the rationale[191] adopted by the Board not requiring water to be released directly from Takapō into the upper Takapō River as the adverse effects on electricity generation outweighed the benefits, after the Board took into consideration factors including:

    a. The costs and other implications of forgone generation by this water not being used for the generation of electricity at Tekapo A, Tekapo B, Ōhau A, B and C power stations;

    b. The costs of changes to structures to enable the permanent discharge of water to the Takapō River;

    c. Ecological issues;

    d. Effects on existing trout habitat and angling;

    e. Effects on amenity values; and

    f. Cultural values, and representations by Ngāi Tahu.

The environmental flow and level regime for the upper Waitaki Catchment reflects the current resource consents and operation of the Tekapo PS, and Genesis is seeking replacement consents that comply with that environmental flow and level regime. Similarly, the existing and proposed consents comply with the water allocation requirements of the WAP which allocate water to the operation of the Tekapo PS. The resource consent applications are consistent with the WAP policies. The rate of abstraction, seasonal duration, and the annual volume of water for the Tekapo PS water take and discharge resource consents are necessary for the operation of the scheme and meet the policy requirements relating to ensuring such rates are reasonable for the proposed use.

While Policy 28 sets out the matters to which the CRC is to consider when making a decision whether to grant or refuse applications for replacement of existing consents,

[191] As set out in the Decision and Principal Reasons for Adopting the Plan Provisions of the Waitaki Catchment Water Allocation Regional Plan (September 2005).

particularly where there are competing demands for the allocation, as these applications are collectively classified as controlled activities, the CRC does not have the discretion to refuse these applications. Notwithstanding this, Genesis has incurred significant expenditure to update and improve the existing Tekapo PS infrastructure to improve the efficiency of water use in the scheme, including canal lining, Tekapo A and B upgrades and improvements to the intake structure. The Tekapo PS has a present book value of approximately $1.124 billion and a likely present value for substitute energy sources such as solar or wind farms of $1.7 to $2.1 billion.

Policies referring to the iconic nature and the mana of Takapō and the Takapō River and providing for temporary lowering of Takapō are implemented by the rule framework of the WAP which provides for the replacement consents associated with the ongoing operation of the Tekapo PS as controlled activities (including provision for temporary lowering of lake levels during electricity shortages). As these replacement consent applications meet the requirements of the controlled activity, it can be concluded that the proposal is consistent with the direction of these policies.

Summary

In the Waitaki Catchment, the provisions of the NPSREG, the CRPS and the objectives and policies of the WAP all confirm that substantial weight should be afforded to providing for the flow and allocation requirements of the Tekapo PS as sought by Genesis as part of this application. The provisions of the WAP recognises that achieving a sustainable management outcome in the Waitaki Catchment may involve effects on some other values. Overall, the resource consents sought for the Tekapo PS provide for the continued operation of the Tekapo PS.

7.2.9 Canterbury Land and Water Regional Plan

The CLWRP, incorporating Plan Changes 1 – 6, became operative on 1 February 2019. The purpose of the CLWRP is to identify resource management outcomes for managing land and water in the Canterbury Region. It contains the relevant objectives and policies for water related activities other than the proposed taking, use, damming and diverting of water (to which the provisions of the WAP apply).

The analysis in this section of this AEE focusses on the most relevant objectives and policies of the CLWRP. Comments on relevant provisions of the CLWRP are contained in **Appendix T**.

The objectives in the CLWRP primarily seek management of land and water as integrated natural resources and to recognise and enable Ngāi Tahu culture, traditions, customary uses and relationships with land and water (Objective 3.1), including application of the ethic of ki uta ki tai (Objective 3.2). They also seek to enable nationally and regionally significant infrastructure (Objectives 3.3, 3.10 and 3.11) while recognising that water is essential to all

life (Objective 3.6), is managed to safeguard its life-supporting capacity (Objective 3.8), that freshwater bodies (including wetlands) are maintained and natural character values, are protected (Objectives 12, 14, 16, 18 and 19).

The resource consents sought for the Tekapo PS are consistent with these objectives in several ways. Genesis has consulted with Meridian in respect of the replacement of resource consents where necessary to ensure that an integrated approach is taken to managing water in the Waitaki Catchment. Genesis acknowledges that Takapō and the Takapō River are significant to Ngāi Tahu culture, traditions, customary uses and relationships with land and water. Genesis has worked collaboratively with Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki to develop a relationship agreement and have agreed a package that includes consent conditions, mitigation, relationship matters and a suite of measures that further provide for the management of adverse effects on Ngā Rūnaka.

The continued operation of the Tekapo PS. will not adversely affect existing wetland or natural character values.

The Tekapo PS is nationally and regionally significant infrastructure that is resilient[192] and positively contributes to economic and social wellbeing throughout New Zealand. The resource consents sought provide for its efficient and effective operation, on-going maintenance, repair, development and upgrading. The continued operation of the Tekapo PS will enable electricity generation from a renewable energy source, which is essential to economic and social wellbeing throughout New Zealand. The resource consents sought for the Tekapo PS include conditions requiring that the scheme is operated in accordance with the environmental flow and level regimes set in the Waitaki Catchment Water Allocation Regional Plan[193] and that the existing environment against which the resource consents were assessed is retained or enhanced.

The policies in the CLWRP (including Policies 4.1 to 4.7) require that lakes, rivers, wetlands and aquifers will achieve freshwater outcomes set in the Plan by 2030. The ongoing operation of the Tekapo PS does not impact the achievement of the freshwater outcomes set out in the CLWRP, noting that those outcomes recognise the Tekapo PS as being part of the existing environment. Genesis acknowledges that the present operation of the Tekapo PS with respect to the in the upper 7km reach of the Takapō River is not consistent with Policy 4.3(f) that reaches of rivers are not induced to run dry or (g) which requires that variability of flow. While not consistent with these provisions, the ongoing operation of the Tekapo PS as sought in the Genesis applications reflects the existing environment as

---

[192] The Tekapo PS has operated for many decades through a wide range of weather and geological (earthquake) situations to supply electricity to New Zealanders. It is also able to supply electricity locally when the National Grid is not available.

[193] For example, proposed water permit conditions 6 – 8, Schedule One General Conditions 1 – 16.

provided for under the WAP and recognised in Policy 4.51 in the CLWRP. The discharge consents sought in this application will not result in the water quality limits in the CLWRP being exceeded.

Genesis has considered matters relating to Ngāi Tahu values (policy 4.14B) to the extent practicable based on its engagement (see section 8.2 of this AEE) and using existing resources such as the Waitaki Iwi Management Plan 2019 (as set out in sections 4.2, 5.3 and 7.2.10 of this AEE). However, the extent to which the Tekapo PS adversely affects statutory acknowledgement areas, nohoanga sites, surface waterbodies, silent file areas or culturally significant sites can only be confirmed Ngāi Tahu representatives.

The resource consents sought for the Tekapo PS do not involve the damming, diversion or taking of water in hāpua, coastal lakes, lagoons or wetlands (Policy 4.43) or of any alpine or hill-fed river or high naturalness waterbody (Policy 4.44).

The Tekapo PS infrastructure is designed to specific criteria and standards to limit the effects of flood events or seismic events on this infrastructure and is maintained and continually assessed against performance criteria (as part of a process safety framework). For example, the upgrade to the Tekapo Intake Structure intake gate is designed to be resilient in a 1 in 10,000 annual exceedance probability seismic event (and associated aftershocks) and the modifications to the high flow management rules discussed in the AEE address Takapō gate safety matters (Policy 4.48).

The rate of abstraction, seasonal duration, and the annual volume of water for the Tekapo PS water take and discharge resource consents are necessary for the operation of the scheme (Policies 4.61, 4.62 and 4.65). The systems used to convey water for the Tekapo PS are designed to maximise efficient use of water. The canal re-lining, intake structure upgrade and Tekapo B runner replacement projects are all examples where Genesis has undertaken projects to increase efficiencies and generation consistent with these provisions (Policy 4.69).

As detailed in the various technical reports supporting this AEE, including the PDP 2023 and Ecological Solutions 2023 assessments, the ongoing operation of the Tekapo PS will not affect the existing values of wetlands in the catchment. In addition, the proposed increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment will actively promote the protection and enhancement of waterbodies and biodiversity in the catchments above the Tekapo PS (Policies 4.81, 4.84, 4.85, 4.85A and 4.86).

7.2.10 Other Relevant Matters

Section 104(1)(c) of the RMA directs that the Panel must also have regard to any other matter they consider relevant and reasonably necessary to determine a resource consent application. The consideration of such matters remains subject to Part 2 of the RMA.

The relevant other matters to the consideration of these resource consent applications are:

a. Te Rūnanga o Ngāi Tahu Freshwater Policy;

b. Ngāi Tahu Resource Management Strategy for the Canterbury Region;

c. He Rautaki mō te Huringa o te Āhuarangi: Te Tāhū o te Whāriki (Te Rūnanga o Ngāi Tahu Climate Change Strategy);

d. Waitaki Iwi Management Plan (2019);

e. Ngāi Tahu Statutory Acknowledgement Areas;

f. Canterbury Water Management Strategy;

g. Upper Waitaki Zone Implementation Programme and Upper Waitaki Zip Addendum;

h. Final Climate Change Commission Report;

i. Emissions Reduction Plan; and

j. National Adaptation Plan.

7.2.10.1 Te Rūnanga o Ngāi Tahu Freshwater Policy

The Te Rūnanga o Ngāi Tahu Freshwater Policy Statement (1999) (the "**Freshwater Policy Statement**") is Ngāi Tahu's overarching policy document relating to the management of freshwater. The Freshwater Policy Statement:

1. Describes Ngāi Tahu's association with freshwater;

2. Details the ways in which Ngāi Tahu want to participate in freshwater management; and

3. Sets out the environmental outcomes sought.

The Freshwater Policy Statement describes that water is central to all Māori life and is a taonga left by ancestors to sustain and provide life.

Matters relevant to the Waitaki and Tekapo Power Schemes for Manawhenua are comprehensively addressed in the TIA included in **Appendix A**. The TIA focuses on the impacts of the Waitaki and Tekapo Schemes, how the Generators propose to mitigate those impacts, and, as a result, the extent to which the consent applications are consistent

with Manawhenua expectations, informed by Te Tiriti. This approach is both necessary and appropriate, given the context of the significant importance of the Waitaki to Kāi Tahu, and the direct relevance of Te Tiriti. As an indigenous cultural assessment, the TIA reflects the aspirations of the Manawhenua side of the Treaty partnership and is intended to contribute to a Treaty-compliant resource management regime.

As set out in their letters of support (**Appendix B**), the Waitaki Rūnaka have recognised the significance of the waters of the Waitaki alongside the significance of the hydro electricity generation to the nation and adopted an intergenerational approach to protecting the health and well-being of the Waitaki Catchment and have agreed a package that includes consent conditions, mitigation, relationship matters and a suite of measures that further provide for the management of adverse effects on the Waitaki Rūnaka. The approach recognises Waitaki Rūnaka rangatiratanga over the Waitaki Catchment and its taonga, including wai māori, and enables greater economic, spiritual and cultural connections for mana whenua.

The Genesis applications propose no material changes to the present Tekapo PS operation and matters identified by Waitaki Rūnaka with respect to the proposed consent conditions are addressed in the proposed conditions in **Appendix D** which have been discussed with them. All other matters are addressed through the relationship agreement between Genesis and the Waitaki Rūnaka.

7.2.10.2 Ngāi Tahu Resource Management Strategy for the Canterbury Region

Te Whakatau Kaupapa / Ngāi Tahu Resource Management Strategy for the Canterbury Region was developed in 1992 and was prepared to assist planners, resource managers and politicians at both regional and district levels. The document is a statement of Ngāi Tahu beliefs and values that should be taken into account in planning and policy decisions.

Matters relevant to the Waitaki and Tekapo Power Schemes for Manawhenua are comprehensively addressed in the TIA included in **Appendix A**. The TIA focuses on the impacts of the Waitaki and Tekapo Schemes, how the Generators propose to mitigate those impacts, and, as a result, the extent to which the consent applications are consistent with Manawhenua expectations, informed by Te Tiriti. This approach is both necessary and appropriate, given the context of the significant importance of the Waitaki to Kāi Tahu, and the direct relevance of Te Tiriti. As an indigenous cultural assessment, the TIA reflects the aspirations of the Manawhenua side of the Treaty partnership and is intended to contribute to a Treaty-compliant resource management regime.

7.2.10.3 He Rautaki mō te Huringa o te Āhuarangi: Te Tāhū o te Whāriki

He Rautaki mō te Huringa o te Āhuarangi (the Strategy) provides direction regarding climate change matters across the spectrum of Ngāi Tahu interests, assets and activities and creates Ngāi Tahu responses to the risks and opportunities presented by climate

change, referencing the entire tribal structure, so that iwi, hapū and whānau aspirations can be met. It establishes a Vision and Strategic Direction, followed by Priorities for Short / Medium Term Actions (to be achieved by 2025) and Longer Term Actions (to be achieved by 2050).

Climate change matters relevant to the Waitaki and Tekapo Power Schemes for Manawhenua are comprehensively addressed in the TIA included in **Appendix A**. The TIA focuses on the impacts of the Waitaki and Tekapo Schemes, how the Generators propose to mitigate those impacts, and, as a result, the extent to which the consent applications are consistent with Manawhenua expectations.

7.2.10.4 Waitaki Iwi Management Plan

Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki (Kā Papatipu Rūnanga) developed the Waitaki Iwi Management Plan (2019) as an expression of rakatirataka and in fulfilment of their kaitiaki responsibilities within the Waitaki Catchment. The plan sets out that the Waitaki River catchment has an important role in the creation of Kāi Tahu, with the catchment being a mahika kai area and part of an integrated network of travel routes leading from coast to coast.

The Waitaki Iwi Management Plan:

1. Describes the values held by Kā Papatipu Rūnanga relating to Aoraki, wai, mahika kai and wūhi tūpuna;

2. Identifies the primary issues Kā Papatipu Rūnanga have in respect of these matters; and

3. Provides for the relationship that Kā Papatipu Rūnanga have with these resources.

Matters relevant to the Waitaki and Tekapo Power Schemes for Manawhenua are comprehensively addressed in the TIA included in **Appendix A**. The TIA focuses on the impacts of the Waitaki and Tekapo Schemes, how the Generators propose to mitigate those impacts, and, as a result, the extent to which the consent applications are consistent with Manawhenua expectations.

As set out in their letters of support (**Appendix B**), the Waitaki Rūnaka have recognised the significance of the waters of the Waitaki alongside the significance of the hydro electricity generation to the nation and adopted an intergenerational approach to protecting the health and well-being of the Waitaki Catchment and have agreed a package that includes consent conditions, mitigation, relationship matters and a suite of measures that further provide for the management of adverse effects on the Waitaki Rūnaka. The approach recognises Waitaki Rūnaka rangatiratanga over the Waitaki Catchment and its taonga, including wai māori, and enables greater economic, spiritual and cultural connections for mana whenua.

The Genesis applications propose no material changes to the present Tekapo PS operation and matters identified by Waitaki Rūnaka with respect to the proposed consent conditions are addressed in the proposed conditions in **Appendix D** which have been discussed with them. All other matters are addressed through the relationship agreement between Genesis and the Waitaki Rūnaka.

7.2.10.5 Ngāi Tahu Statutory Acknowledgement Areas

Part 12 of the Ngāi Tahu Claims Settlement Act 1998 identifies several Statutory Acknowledgements and Statutory Areas (the area to which an Acknowledgement relates) within the Ngāi Tahu rōhe. These are areas where the Crown acknowledges particular Te Rūnanga o Ngāi Tahu cultural, spiritual, historic, and traditional associations. The purpose of the statutory acknowledgements are:[194]

(a) To require that consent authorities forward summaries of resource consent applications to Te Rūnanga o Ngāi Tahu, as required by regulations made pursuant to section 207; and

(b) To require that consent authorities, Heritage New Zealand Pouhere Taonga, or the Environment Court, as the case may be, have regard to the statutory acknowledgements in relation to the statutory areas, as provided in sections 208 to 210; and

(c) To empower the Minister of the Crown responsible for management of the statutory areas, or the Commissioner of Crown Lands, as the case may be, to enter into deeds of recognition, as provided in section 212; and

(d) To enable Te Rūnanga o Ngāi Tahu and any member of Ngāi Tahu Whānui to cite statutory acknowledgements as evidence of the association of Ngāi Tahu to the statutory areas, as provided in section 211.

Matters relevant to the Waitaki and Tekapo Power Schemes for Manawhenua are comprehensively addressed in the TIA included in **Appendix A**. The TIA focuses on the impacts of the Waitaki and Tekapo Schemes, how the Generators propose to mitigate those impacts, and, as a result, the extent to which the consent applications are consistent with Manawhenua expectations.

7.2.10.6 Canterbury Water Management Strategy

The Canterbury Water Management Strategy ("**CWMS**") provides a collaborative framework to help manage the multiple demands on water within the region. The vision of the CWMS is:

---

[194] Section 21 "Purposes of statutory acknowledgements", Ngāi Tahu Claims Settlement Act 1998.

> To gain the greatest cultural, economic, environmental, recreational and social benefits from our water resources within a sustainable framework both now and for future generations.

There are three primary principles of the CMWS. The first principle is that water is managed in accordance with sustainability principles and to be consistent with the RMA. The second primary principle provides that the planning of water use is to be guided by first and second order priority considerations. Those in the first order are the environment, customary use, community supplies, and stock water. Those in the second order are irrigation, renewable electricity generation, recreation, tourism, and amenity. The third primary principle provides for kaitiakitanga.

The supporting principles include natural character, indigenous biodiversity, access, quality of drinking water, recreational and amenity opportunities, and community and commercial use.

The CWMS focusses on delivering a balanced set of quantified outcome targets by specified dates. It sets out that the measurable outcome targets will be in the following areas:

a. Drinking water;

b. Irrigated land area;

c. Energy security and efficiency;

d. Ecosystem health/biodiversity;

e. Water use efficiency;

f. Kaitiakitanga;

g. Regional and national economic growth;

h. Natural character of braided rivers; and

i. Recreational and amenity opportunities.

In respect of renewable electricity generation assets within the Canterbury Region, the CWMS sets out that Canterbury's water bodies play a critical role in the provision of renewable energy and security of electricity supply in New Zealand. The existing hydro-electricity infrastructure (including the Tekapo PS) in Canterbury is nationally important and its use, because it is already in place and paid for, is economically efficient for New Zealand.

The targets in the CWMS require that the zone and regional committees preserve the existing contributions of hydro-generation, including that from the Tekapo PS.

Zone Committees were set up to facilitate community engagement and (by consensus where possible) to identify community informed outcomes specific to their zone. The Tekapo PS is located in the Upper Waitaki Zone, which has prepared a ZIP that sets out how the CWMS will be implemented in the upper Waitaki. The Upper Waitaki ZIP is discussed in the following section.

7.2.10.7 Upper Waitaki Zone Implementation Programme

The Upper Waitaki ZIP and the ZIP addendum contain the upper Waitaki water zone committee's recommendations to the CRC to give effect to the CWMS in the Upper Waitaki Zone. It is a non-statutory document. The ZIP sets out priority outcomes for the zone, including:

a. Water quality and water quantity supports mahinga kai gathering;

b. Waterbodies are safe for contact recreation and have improved lake habitat, fish passage, and customary use, and flows that support natural processes;

c. The braided river systems within the zone support ecosystems and the rivers are protected as outstanding recreation resources and natural habitat areas;

d. The zone has safe and secure drinking water sources;

e. Biodiversity of the zone is protected and enhanced where appropriate;

f. Having highly reliable irrigation water;

g. Energy security and efficiency – maintain or increase the zones existing contribution to New Zealand's security of electricity supply; and

h. There is no further reduction in water quality.

The ZIP also sets out the principles of kaitiakitanga including ki uta, ki tai, and notes that the principles of kaitiakitanga have been weaved throughout the ZIP.

The ZIP contains a number of recommendations specific to hydro-electricity generation in the zone, including:

1. Recommendation 1.11 – Hydroelectricity companies pursue opportunities to increase efficiencies and generation through enhancement of consents and refurbishments and investment are pursued;

2. Recommendation 2.2 – Recognise the contribution to attaining CWMS targets already made by Waitaki Hydro Electricity Scheme and the associated mitigation initiatives. Ensure that the national importance of the scheme is acknowledged;

3. Recommendation 3.3 – Develop programmes to complement Project River Recovery for the protection and enhancement of braided river ecosystems,

including predator and weed control and further investigation into the impacts and management of didymo; and

4. Recommendation 3.4 – Assess whether district plans and regional plans could provide greater support/ enabling of initiatives that are part of Project River Recovery.

The replacement resource consents sought (including the proposed consent conditions and mitigation measures) are consistent with the direction of the ZIP. For example, with respect to recommendation 1.11, Genesis has implemented the canal lining, intake structure and Tekapo B runner replacement and Tekapo A upgrade projects to increase efficiencies and generation. With respect to recommendation 2.2, the national importance of the Tekapo PS is acknowledged in the CRPS and the NPSFM and for recommendations 3.3 and 3.4 it is noted that Genesis has reached agreement with DoC and Meridian for increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment consistent with (and expanding upon) Project River Recovery.

7.2.10.8 Climate Change Reports

In May 2021, the Climate Change Commission released its final report, titled *Ināia tonu nei: a low emissions future for Aotearoa*, detailing its advice in respect to the commitment made by the Government to reach net zero emissions of long-lived gases by 2050. The report provides useful context, and reiterates the importance of renewable electricity generation, including the Tekapo PS, and the combined WPS, in meeting New Zealand's climate change aspirations. The report sets out key elements of policy direction, including:

a. Work in partnership with Iwi/Māori, and with local government, to ensure the transition to a low-emissions economy is firmly rooted in the principles of Te Tiriti o Waitangi/The Treaty of Waitangi;

b. Send clear and consistent signals about how Aotearoa will transition to low emissions and work together across political parties, government agencies and local government;

c. Improve the New Zealand Emissions Trading Scheme so that it provides stronger market incentives to drive low-emission choices;

d. Make sure all government policy and investment decisions support the transition to low emissions; and

e. Develop a national energy strategy to decarbonise the energy system and introduce measures to make sure the electricity sector is ready to meet future needs.

The report identifies a number of key transitions along the demonstration path[195]; including in respect of electricity:

1. Budget 1: Phase out fossil base load generation;

2. Budget 2: Transmission and distribution grid upgrades and expand renewable generation; and

3. Budget 3: Achieve 95% renewable generation.

In addition, the report sets out that:

1. The use of low emissions electricity allows other sectors to reduce emissions. Electrifying transport and process heat will require significant expansion in electricity generation capacity. Demand for electricity will also increase as buildings and process heat switch away from fossil fuels;

2. The long-term scenarios showed that renewable generation needs to rapidly expand in the 2030s and beyond to meet increased electricity demand as electric vehicles are widely adopted;

3. In the short term, there is a concern that electricity generation companies may not commit to the necessary expansion while there is uncertainty around the future of the New Zealand aluminium smelter at Tiwai Point; and

4. Wind, solar and geothermal offer low cost and low emissions ways of generating electricity. "The demonstration path" would see 3.8 TWh of currently committed (consented) generation projects built between 2020 and 2024. The building of further renewables pauses due to the New Zealand aluminium smelter closing and resumes in the late 2020s. Beyond 2030, the modelling shows increases in wind, solar and geothermal generation greater than 1 TWh per year is required.

The Climate Change Commission recommends[196] that the government develop a comprehensive energy strategy to ensure actions to decarbonise are considered across the whole energy system. This includes setting a system-wide renewable energy target and increased investment in energy efficiency. A strategy would help Aotearoa leverage its extensive existing renewable electricity resources to decarbonise areas like transport and industry and reduce fossil fuel use in building. Additionally, the Climate Change Commission recommends a target of 50% of all energy consumed to come from renewable sources (currently this figure is approximately 30%) by 2035. This target is across the energy system, which includes electricity, process and building heat, and transport.

---

[195] Table 7.1.

[196] Īnāia tonu nei: a low emissions future for Aotearoa, Recommendation 20.

The Commission also considers that Aotearoa needs to maximise the use of electricity as a low emissions fuel, stating that Aotearoa is unique in that its hydro lakes contribute around 60% of total electricity supply. However, these lakes only hold enough water for a few weeks of winter energy demand if inflows (rain and snow melt) are very low. When inflows are low for long periods of time, hydro generation reduces, and the system relies on other forms of generation – such as fossil gas and coal. These periods of time are often referred to as 'dry years', and often result in very expensive wholesale electricity prices. New renewable generation will need to be built rapidly to meet the projected increase in electricity demand, and the report identifies that many forms of renewable generation, including hydro, wind and geothermal, have the potential to "come into conflict the resource management system" due to effects on freshwater and biodiversity:

To ensure the fast-paced and sustained build of low-emissions electricity, resource consent approval processes, other national and local government instruments, and settings for transmission and distribution investment decisions need to uphold Te Tiriti o Waitangi/The Treaty of Waitangi and be aligned with the required pace for build.

The report also notes that building new hydroelectric dams or expanding existing assets could be part of the response to meet emissions budgets and targets, however this would result in substantial environmental effects.

The findings and recommendations of the Climate Change Commission reiterate the importance of New Zealand's existing hydro-electricity generation fleet and reinforce the need to protect the output from existing assets, thus reducing reliance on yet to be identified and implemented alternatives. The grant of consents for the Tekapo PS is consistent with (and critical to) the findings of the Climate Change Commission.

7.2.10.9 Emissions Reduction Plan

The emissions reduction plan published by the Minister of Climate Change under section 5ZI of the Climate Change Response Act 2002[197] responds to the recommendations of the Climate Change Commission report, "*Ināia tonu nei: a low emissions future for Aotearoa*" and again highlights the reliance New Zealand has on its already high level of electricity generation from renewable energy resources. Action 11.2.1 in the report is to "*Accelerate development of new renewable electricity generation across the economy*" identifies the need "*to generate more electricity from existing low-emissions technologies*" and "*to increase our use of new technologies*". Those actions are based on the already high level of electricity generation[198] from renewable energy resources in New Zealand. For example, on page 204, the plan notes that:

---

[197] Te hau mārohi ki anamata: Towards a productive, sustainable and inclusive economy, published by the Ministry for the Environment, May 2022.

[198] For example, see pages 202, 204, 211.

> *Aotearoa New Zealand's energy system is highly renewable by international standards. Just over 40 per cent of our total primary energy supply[199] and nearly 28 per cent of our total final energy consumption[200] comes from renewable energy sources.*

New Zealand's second emissions reduction plan for the period 2026-30 (*Ta Aotearoa mahere whakaheke tukunga tuarua*) was published by the Minister of Climate Change under section 5ZI of the Climate Change Response Act 2002 in December 2024. This plan continues the reliance on use of renewable energy to meet New Zealand's emission reduction targets. The plan states that the Government has committed to doubling renewable energy by 2050 and that a key policy of the second emissions reduction plan is "Electrify NZ" which is the work programme to support private investment in electricity generation and networks that will enable achievement of the goal. Electrify NZ includes initiatives such as progressing the Fast-track Approvals legislation to create a one-stop-shop allowing for faster, more efficient consents for nationally or regionally significant renewable energy and transmission projects, amending the RMA, advancing amendments to the National Policy Statements for Renewable Electricity Generation and Electricity Transmission, developing a regime for offshore renewable energy, and further RMA national direction to enable a range of energy and infrastructure projects. The second emissions reduction plan is clear that renewable energy is critical to meeting emission reduction targets.

In December 2024, two reports were released by the Climate Change Commission on Aotearoa New Zealand's medium- and long-term climate goals. The reports note that since 2019 it has also become increasingly clear that current global action is not sufficient to limit warming to 1.5°C above pre-industrial levels and that average global temperatures are already close to that threshold. It is highly likely that average warming will exceed 1.5°C within the next 10 years, bringing increased risk of severe and widespread climate impacts, implying that even greater reductions in global emissions are needed in the near and longer terms to limit as much as possible the amount by which the world exceeds 1.5°C. The reports also state that the impacts of global warming are greater in both severity and scale than was understood in 2019, with greater impacts being felt at lower temperature levels than previously expected and are becoming more severe and more widespread as the planet warms.

The first report is a review of the 2050 target and recommends that New Zealand's target be amended from net zero emissions of all greenhouse gases (other than biogenic methane and excluding aviation and international shipping) to require net emissions of all

---

[199] Total primary energy supply is the amount of energy available for use in Aotearoa, accounting for imports and exports.

[200] Total final energy consumption is the total energy consumed by end users, such as households and industry. It excludes energy that the energy sector uses itself, energy transformation and distribution losses.

greenhouse gases other than biogenic methane to reach at least net negative 20 MtCO2e by 2050, with emissions from international shipping and aviation to be included in the target.

The second report is advice on emissions budgets, showing that Aotearoa New Zealand has options to get on track to the current 2050 emissions reduction target. The recommended level for the fourth emissions budget is 160 MtCO2e, meaning that the net average annual emissions in the budget period (2036–2040) would be 56% lower than they were in 2022. Also recommended is a limit of zero for offshore mitigation to meet the fourth emissions budget.

Reconsenting the Tekapo PS on the same basis as it is presently authorised is consistent with meeting the recommendations of the Climate Change Commission and the Emissions Reduction Plan in that it does not involve any reduction in the present level of renewable electricity generation from the scheme. Any reduction in generation output resulting from additional restrictions imposed on the present operating regime through the reconsenting process will be inconsistent with meeting the Climate Change Commission recommendations and the Emissions Reduction Plan and would fundamentally change the basis on which the Commission recommendations and the Emissions Reduction Plan actions have been developed. Not granting the consents on the basis sought would also seriously undermine New Zealand's ability to deliver on the Emissions Reduction Plan outcomes.

The combination of the present emissions reduction plan and the recommendations above regarding future plans and targets is that there is now even more need to ensure that existing renewable electricity generation activities can continue and are not restricted ways that would reduce output.

7.2.10.10 National Adaptation Plan

Aotearoa New Zealand experiences a wide range of natural hazards, from earthquakes and volcanoes to erosion, landslides and extreme weather events. Climate change will increase the severity and frequency of some of those hazards, including flooding, heatwaves, drought and wildfire. These effects will impact New Zealanders in different ways, with a risk that some groups may be disproportionately affected.

Emitting less greenhouse gases and limiting global warming are important steps towards adapting to the effects of climate change. The first emissions reduction plan[201] sets a track towards a low-emissions, resilient economy. The plan sets out Aotearoa New Zealand's

[201] *Urutau, ka taurikura: Kia tū pakari a Aotearoa i ngā huringa āhuarangi Adapt and thrive: Building a climate-resilient New Zealand*, Aotearoa New Zealand's first national adaptation plan. Wellington. Ministry for the Environment, August 2022.

long-term strategy and first national adaptation plan. The long-term strategy sets out the Government's approach to adaptation.

The plan records that in the past 100 years, New Zealand's climate has warmed by 1.1 °C, and in 2021 Aotearoa experienced its warmest year on record, with sea-level rise accelerating and extreme weather events (such as storms, heatwaves and heavy rainfall) becoming more frequent and intense. The plan identifies how New Zealand will adapt to both slow-onset changes, such as rising sea levels, and increased frequency and magnitude of extreme events.

This adaptation is underpinned by an increasing reliance on renewable electricity generation to meet future energy needs, for example by adapting to use of electric powered vehicles and moving away from fossil fuel powered heating and drying. Maintaining the renewable electricity generation capacity afforded by the Tekapo PS is therefore one of the foundations for New Zealand's adaptation to climate change effects.

7.2.11 Section 104(2A) of the RMA – Value of Investment

Under schedule 5, clause 17 of the FTA, the Panel must take into account (while giving the greatest weight to the purpose of the FTA) the provisions of Parts 2, 3, 6, and 8 to 10 of the Resource Management Act 1991 that direct decision making on an application for a resource consent.[202]

Part 6, section 104(2A) of the RMA requires that when considering a renewal of an existing resource consent, the Panel must *"have regard to the value of the investment of the existing consent holder"*:

> **104 Consideration of applications**
>
> ...
>
> (2A) When considering an application affected by section 124 or 165ZH(1)(c), the consent authority must have regard to the value of the investment of the existing consent holder.

The value to Genesis of its investment in the Tekapo PS can be considered in terms of either the present book value of the scheme (approximately $1.124 billion) or the likely present value of substitute energy sources such as solar or wind farms of approximately $1.7 to $2.1 billion.[203] By both these measures, the value of the Tekapo PS is a significant investment.

---

[202] FTA, schedule 5, clause 17(1)(b).

[203] Concept Consulting, 2025.

7.2.12 Section 104A of the RMA – Determination of Controlled Activities

Section 104A of the RMA sets how resource consents for controlled activities are to be determined:

> **104A Determination of applications for controlled activities**
>
> After considering an application for a resource consent for a controlled activity, a consent authority—
>
> (a) must grant the resource consent, unless it has insufficient information to determine whether or not the activity is a controlled activity; and
>
> (b) may impose conditions on the consent under section 108 only for those matters—
>
> (i) over which control is reserved in national environmental standards or other regulations; or
>
> (ii) over which it has reserved its control in its plan or proposed plan.

As detailed throughout this AEE, the Panel must grant these consent applications as a controlled activity. In respect of consent conditions, Table 25 details the matters to which control has been reserved in the WAP and CLWRP. Conditions of consent have been proposed by Genesis that address these matters of control.

Table 25: Matters to Which Control has been Reserved

Matter of Control	Comment
WAP	
(a) In respect of flows into the Pūkaki River, the Lower Ōhau River or the Tekapo River (above the confluence with the Forks Stream), adverse effects, including effects on Ngāi Tahu culture, traditions, customary uses and relationships with land and water, unless the environmental flow and level regimes for these rivers have been reviewed after the public notification date of this rule and the outcome of the review has become operative in accordance with clause 20 of Schedule 1 to the Resource Management Act	The resource consents sought seek a continuation of the existing flow regime for the Takapō River and are in accordance with the flow regime provided within the WAP[204].
(b) Any mitigation measures to address adverse effects (including effects on Ngāi Tahu culture, traditions, customary uses and	As set out in the TIA in **Appendix A**, Waitaki Rūnaka have worked collaboratively with the Generators during the pre-consenting process

[204] For example, proposed water permit conditions 6 – 8, Schedule One General Conditions 1 – 16.

Matter of Control	Comment
relationships with land and water), except for changes or alterations to environmental flow and level regimes, minimum lake levels, annual allocation to activities, or the provision of flows into the Lower Waitaki River, set by this Plan;	to develop a package that enables Waitaki Rūnaka to derive benefits, while the nation retains access to the use of freshwater for renewable electricity generation. This package includes consent conditions, mitigation, relationship matters and a suite of measures that provide for the management of adverse effects on Ngā Rūnaka. Genesis will continue, and increase funding for, an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment. This acknowledges that the habitats and species characteristic of braided rivers have been affected by hydroelectricity development. Genesis proposes to provide specific funding for sport fishery matters and whitewater recreation activities, alongside funding for amenity matters.
(c) Collection, recording, monitoring and provision of information concerning the exercise of consent; and	The proposed conditions provide for appropriate monitoring of the exercise of the consents sought.[205]
(d) Lapse period, duration of consent and review requirements.	A duration of 35 years is sought for these resource consents, as discussed in Section 3.5 of this AEE. As the consents sought are for replacement of existing consents, a lapse period is not necessary as the consents will be given effect to once the exiting consents expire. The proposed conditions provide opportunities for the conditions of consent to be reviewed.[206]
CLWRP	
1. Measures that will ensure any relevant water quality outcomes (freshwater objectives, limits or targets) set out in Section 15B of this	The resource consents sought seek a continuation of the existing operating regime for the Tekapo PS and is in accordance with the

[205] For example, proposed water permit conditions 10 – 12, Schedule One General Conditions 26 – 39.

[206] For example, proposed water permit condition 9, Schedule One General Conditions 41 – 43.

Matter of Control	Comment
Plan, or in the absence of any water quality outcomes in Sections 15B the outcomes in Tables 1a and 1b of this Plan, are met; and	limits specified within the WAP. Continued operation will not affect the meeting of freshwater objectives, limits or targets.
2. Any mitigation measures to address adverse effects of the discharge on the environment, including effects on Ngāi Tahu culture, traditions, customary uses and relationships with land and water; and	As set out in the TIA in **Appendix A**, Waitaki Rūnaka have worked collaboratively with the Generators during the pre-consenting process to develop a package that enables Waitaki Rūnaka to derive benefits, while the nation retains access to the use of freshwater for renewable electricity generation. This package includes consent conditions, mitigation, relationship matters and a suite of measures that provide for the management of adverse effects on Ngā Rūnaka. Genesis will provide increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment and proposes to provide funding for specific fishery matters and whitewater recreation action activities, alongside funding for amenity matters.
3. Collection, recording, monitoring and provision of information concerning the exercise of consent.	The proposed conditions provide for appropriate monitoring of the exercise of the consents sought.[207]

7.3 PART 2 MATTERS

Assessment of resource consents applications under section 104, and the role of Part 2, have continued to evolve. Most recently, the Supreme Court in Royal Forest and Bird Protection Society of New Zealand Inc v New Zealand Transport Agency[208] (East-West Link) affirmed the approach set out by the Court of Appeal in the decision of *RJ Davidson Family Trust v Marlborough District Council*[209] (*Davidson*). In summary:

[207] For example, proposed water permit conditions 10 – 12, Schedule One General Conditions 26 – 39.

[208] *Royal Forest and Bird Protection Society of New Zealand Inc v New Zealand Transport Agency* [2024] NZSC 26, [2024] 1 NZLR 241.

[209] *RJ Davidson Family Trust v Marlborough District Council* [2018] NZCA 316, [2018] 3 NZLR 283.

(a) The starting point for section 104 is to assess the application with "*a fair appraisal of the objectives and policies read as a whole*."[210] This does not mean that all the objectives and policies can be blended together, "*rather, attention must be paid to relevant objectives and policies both on their own terms and as they relate to one another in the overall policy statement or plan*."[211]

(b) Then, notwithstanding *King Salmon*,[212] RMA decision-makers can have regard to Part 2 if it is appropriate to do so[213] (that is the implication of the words "*subject to Part 2*" in section 104);[214]

(c) When this is "appropriate" will depend on the planning document:

(i) Where the relevant plan provisions have clearly given effect to Part 2, there may be no need to refer back as it "*would not add anything to the evaluative exercise*".[215] It would be inconsistent with the scheme of the RMA to override those plan provisions through recourse to Part 2. In other words, "*genuine consideration and application of relevant plan considerations may leave little room for pt 2 to influence the outcome*";[216] and

(ii) On the flip side, it is appropriate to have regard to Part 2 if, having reviewed the objectives and policies of the plan as a whole:[217]

(1) (i) above is not the case (i.e., the plans have not provided a coherent set of policies that reflect clear environmental outcomes); or

(2) If the decision-maker considers that the plan has not been competently prepared (i.e., has not been prepared in a manner that appropriately reflects the provisions of Part 2).

The Environment Court in *Ohau Protection Society Inc v Waitaki District Council* summarised the position as follows:[218]

---

[210] *Davidson* at [73]. *East-West Link* at [79] confirms that the s104D approach will be the same under s104.

[211] *East-West Link* at [80].

[212] See *Environmental Defence Society Inc v New Zealand King Salmon Company Ltd* [2014] NZSC 38, [2014] 1 NZLR 593.

[213] At [47].

[214] At [75].

[215] At [75], noting that "*absent such an assurance, or if in doubt, it will be appropriate and necessary to [consider Part 2]*".

[216] At [82].

[217] At [74]–[75].

[218] *Ohau Protection Society Inc v Waitaki District Council* [2018] NZEnvC 243 at [16] and [17]. While this decision pre-dates East-West Link, it still holds.

> *the obligation to refer to pt 2 remains unless the consent authority is assured that it would not add to its evaluative exercise under s104 RMA to do so.*
>
> ...
>
> *The exercise for the decision-maker, as RJ Davidson reflect, is one of evaluative judgment on the evidence and in the particular context.*

For these applications, the relevant plan provisions have clearly given effect to Part 2, with the exception of NPSFM 2020 matters that are yet to be more comprehensively addressed through the respective plans. The NPSFM matters have been considered in section 7.2.6 of this AEE. Notwithstanding this, and for completeness, Part 2 of the RMA has been given consideration as follows.

The purpose of the RMA is set out in Section 5 of the Act:

> ...managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—
>
> (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
>
> (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
>
> (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

With respect to sustaining the potential of natural and physical resources and safeguarding the life-supporting capacity of water and ecosystems, the relevant technical assessments demonstrate that the potential effects of the can be appropriately avoided, remedied and / or mitigated.

Sections 5 and 6 of this AEE, along with the proposed consent conditions provide details on the measures proposed by Genesis to avoid, remedy or mitigate the actual and potential effects on the environment in accordance with section 5 of the RMA. In the context of section 5 of the RMA, the following matters are of particular relevance when considering the Tekapo PS:

1. The Tekapo PS, and the combined WPS, are nationally significant longstanding "physical resources" that have been part of the existing environment since first work commenced on the Waitaki Dam and Tekapo A in the 1930s, and they are subject to the principle of sustainable management;

2. The ongoing operation of the Tekapo PS enables people and communities (locally, regionally and nationally) to provide for their social, economic and cultural wellbeing and for their health and safety;

3. The water diverted is used efficiently by the Tekapo PS, and generates electricity within multiple power stations;

4. The combined WPS forms a substantial body of renewable electricity generation, with the Waitaki based schemes alone contributing, on average, 25% of New Zealand's renewable electricity generation;

5. The Tekapo PS is of national significance in providing security of supply to New Zealand's electricity network, particularly in the South Island. The Tekapo PS and other Waitaki power stations alone provide up to 65% of New Zealand's controllable hydro storage capacity;

6. Electricity is a vital resource for New Zealand. There can be no sustainable management of natural and physical resources without energy, of which electricity is a major component;

7. If the operation of Tekapo PS is constrained, including restricting access to water, it will have a significant adverse effect on the ability of the scheme to generate electricity (as discussed in Concept Consulting 2025);

8. The Climate Change Commission has highlighted the national significance and importance of renewable electricity generation for meeting New Zealand's climate change targets and its international obligations. The Tekapo PS is a significant (25%) existing contributor to limiting the extent of New Zealand's present climate change gas discharges and with the regime Genesis proposes, will continue to provide that role within New Zealand's international obligations;

9. The Emissions Reduction Plan relies on a transition to renewable electricity generation to reduce greenhouse gas emissions and continuation of existing levels of renewable electricity generation via the Tekapo PS is a key part of maintaining existing renewable electricity generation levels and providing a base for that transition to occur; and

10. Genesis has proposed a suite of consent conditions that robustly addresses the effects on the environment.

With respect to the key matters in sections 6 and 7 of the RMA,[219] the following points are pertinent:

[219] Section 8 is disapplied by the FTA.

a. The ongoing use of the Tekapo PS, broadly under the same operating parameters, will maintain the existing natural character values of the Takapō River and the margins of Takapō (section 6(a)) as discussed in Boffa Miskell Landscape, 2023;

b. The proposed activities will not affect the protection of any outstanding natural features and landscapes in the surrounding environment as discussed in Boffa Miskell Landscape, 2023. The MDP explicitly recognises the WPS as being part of the Mackenzie Basin outstanding natural landscape (section 6(b));

c. There will be no additional effects of the ongoing operation of the Tekapo PS on significant indigenous vegetation and significant habitats of indigenous fauna as discussed in Ecological Solutions 2023. The continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment as proposed will also ensure that significant indigenous vegetation and significant habitats of indigenous fauna in the vicinity of the Tekapo PS are protected and enhanced (section 6(c));

d. The ongoing operation of the Tekapo PS will not change the nature of public access to water resources currently provided (section 6(d)) and the Tekapo PS provides additional opportunities for public access for fishing and other recreational amenities (see Rob Greenaway & Associates 2023);

e. Sections 6(e) and 7(a) of the RMA refer to the relationship of Māori with their ancestral waters and other taonga and the need to have particular regard to kaitiakitanga. As set out in the TIA in **Appendix A**, Waitaki Rūnaka have worked collaboratively with the Generators during the pre-consenting process to develop a package that enables Waitaki Rūnaka to derive benefits, while the nation retains access to the use of freshwater for renewable electricity generation. This package includes consent conditions, mitigation, relationship matters and a suite of measures that provide for the management of adverse effects on Ngā Rūnaka.

f. The Tekapo PS is not located in an area that is subject to any current protected customary rights by any entity (section 6(g));

g. Section 7(b) of the RMA is concerned with the efficient use and development of natural and physical resources. The water diverted / used by the Tekapo PS is used efficiently and generates electricity within multiple power stations. Genesis has demonstrated its commitment to maintaining or enhancing the efficiency of the scheme through the canal lining, turbine runner replacement and power station upgrade projects it has undertaken;

h. The ongoing operation of the Tekapo PS will not affect the existing amenity values (section 7(c)) of the environment (see Boffa Miskell Landscape, 2023 and Rob Greenaway & Associates 2023);

i. Sections 7(d), (f) and (g) of the RMA relate to the intrinsic values of ecosystems, the quality of the environment, and the finite characteristics of natural and physical resources. All of these matters have been given consideration in the technical assessments commissioned by Genesis – and a comprehensive range of consent conditions and monitoring is proposed to ensure that potential effects on the wider environment are appropriately avoided, remedied or mitigated;

j. The effects of climate change have been considered in the PDP assessment relating to hydrology and hydrogeology. In addition, the operation of the Tekapo PS supports the governments climate change aspirations and renewable electricity generation targets (section 7(i)); and

k. As set out in the TIA in **Appendix A**, Waitaki Rūnaka have worked collaboratively with the Generators during the pre-consenting process to develop a package that enables Waitaki Rūnaka to derive benefits, while the nation retains access to the use of freshwater for renewable electricity generation. This package includes consent conditions, mitigation, relationship matters and a suite of measures that provide for the management of adverse effects on Ngā Rūnaka.

Overall, and based on the technical assessments that have been commissioned by Genesis, it is considered that the proposal, in accordance with appropriate management controls and monitoring, will promote the sustainable management of natural and physical resources accordance with Part 2 of the RMA.

7.4 SECTION 105 OF THE RMA – MATTERS RELEVANT TO DISCHARGE APPLICATIONS

In addition to the matters which the Panel must have regard to under section 104, section 105 of the RMA sets out additional matters which must be considered when considering discharge applications. Section 105 states:

> (1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—
>
> (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
>
> (b) the applicant's reasons for the proposed choice; and
>
> (c) any possible alternative methods of discharge, including discharge into any other receiving environment.

The nature of the discharges associated with the Tekapo PS, and the sensitivity of the receiving environments, are detailed in the ecology and water quality assessments prepared by Cawthron and Water Ways Consulting.

For both the applicant's reasons for the proposed choice and other viable alternative methods of discharge, this is an existing activity which forms the existing environment and its reconsenting is a controlled activity. Given the scale of the Tekapo PS and its length of operation, departing from the current operations (which are not proposed and would have a more restrictive activity status) would have significantly greater effects than the status quo. Further changes would be very expensive, have their own environmental effects (potentially significant), may require their own resource consents and, if resulting in a reduction of generation, would have significant effects on New Zealand's response to climate change and the meeting of targets adopted in that regard. Accordingly, there are no other practicable alternatives.

7.5 SECTION 107 OF THE RMA – RESTRICTION TO GRANT CERTAIN DISCHARGE PERMITS

Section 107 of the RMA[220] specifies certain circumstances in which the Panel must not grant a discharge permit if after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:

i. The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials.

ii. Any conspicuous change in the colour or visual clarity.

iii. Any emission of objectionable odour.

iv. The rendering of fresh water unsuitable for consumption by farm animals.

v. Any significant adverse effects on aquatic life.

As is outlined in Section 5 of this AEE, the discharges associated with the operation of the Tekapo PS will not give rise to any of the listed effects in the receiving waters after reasonable mixing. As such, section 107 of the RMA does not pose any restriction to the granting of the resource consent applications. Further, if the Panel were to find otherwise it can only decline the application based on section 85(3) of the FTA.

[220] Section 107 of the RMA was amended mended by section 24(1) of the Resource Management (Freshwater and Other Matters) Amendment Act 2024 (2024 No 43) by inserting "or (2A)" after "subsection (2)" in section 107(1) and inserting a new subsection 2A after section 107(2). The amendments do not alter the section 107 assessment for the Tekapo PS applications.

7.6 SECTION 124B OF THE RMA – APPLICATIONS BY EXISTING HOLDERS OF RESOURCE CONSENTS

Section 124B of the RMA applies when a person holding an existing resource consent to undertake an activity makes an application to replace that consent. These matters are now addressed by section 30 of the FTA. As noted in section 1.5.4 of this document, section 30 of the FTA does not apply to the Tekapo PS application for replacement resource consents for the Tekapo PS.

8. CONSULTATION AND ENGAGEMENT

8.1 INTRODUCTION AND GENESIS APPROACH

Genesis is committed to working proactively, consulting and engaging with mana whenua, iwi, local communities and key stakeholders in the area in which the Tekapo PS is located.

Genesis' approach to consultation and engagement is to be open, honest, inclusive and approachable. As such, consultation and engagement with mana whenua and key parties began as early as it practically and meaningfully could be in 2018 and has continued since that time.

In particular Genesis has:

1. Commenced consultation early, as indicated above;
2. Built upon existing relationships to engage with parties effectively, particularly over the last three years, given the known effects of the Tekapo PS;
3. Undertaken engagement in a proactive and flexible way to best fit the persons or parties being engaged with;
4. Provided funding and resourcing to assist with consultation as appropriate;
5. Ensured that the Genesis consent project team was accessible and available as appropriate;
6. Attended many hui, both in-person and online;
7. Sought to be respectful of all views, issues, and kōrero shared during engagement;
8. Provided information and site visits as appropriate, and provided technical assessments to assist with understanding of what is proposed and what has been assessed;
9. Confirmed that Genesis is not seeking any alterations to the current operational parameters associated with the ongoing operation of the Tekapo PS apart from an adjustment to the flood operating rules; and
10. Amended, as appropriate, technical assessments, the application, the proposed consent conditions and the proposed mitigation measures to respond to and incorporate feedback from the Waitaki Rūnaka and key stakeholders.

The following sections provide an overview of the consultation and engagement that was undertaken to support the preparation of this AEE and the reconsenting of the Tekapo

PS. Feedback from Waitaki Rūnaka and key stakeholders over the last three years has informed this application, the proposed consent conditions and the proposed mitigation measures.

8.2 MANAWHENUA

Genesis acknowledges the significant importance of the Waitaki Catchment to the Waitaki Rūnaka and Kāi Tahu whānui. As such, significant effort and resource has been directed towards engagement with Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki (collectively referred to as the Waitaki Rūnaka or Manawhenua) as holding mana whenua in the Waitaki Catchment. The Waitaki Rūnaka were supported by Te Rūnanga o Ngāi Tahu ("**TRoNT**") representatives, advisors, planning experts and RMA lawyers throughout our engagements. Throughout the discussions, TRoNT representatives were very clear that their role was in support of the Waitaki Rūnaka as mana whenua.

Genesis' engagement and consultation was undertaken with the representatives of the three Papatipu Rūnanga (Waitaki Rūnaka) jointly with Meridian representatives, as appropriate, as all parties agreed that joint engagement would be an efficient and effective use of time and resources, as well as being able to consider the combined WPS and its ongoing effects holistically.

Genesis has worked collaboratively with Te Rūnanga o Arowhenua, Te Rūnanga o Waihao and Te Rūnanga o Moeraki prior to lodging the application and will continue to do so throughout the application process. As a result of those discussions, Ngā Rūnaka provided letters of support for the RMA applications, attached in **Appendix B**.

As set out in their letters of support, Ngā Rūnaka have recognised the significance of the waters of the Waitaki alongside the significance of the hydro electricity generation to the nation and adopted an intergenerational approach to protecting the health and well-being of the Waitaki Catchment. Ngā Rūnaka have therefore worked collaboratively with Genesis and Meridian to develop a package that includes:

1. Conditions that are to be attached to the resource consents;
2. A mitigation package for the duration of the consents;
3. An enhanced relationship agreement between Genesis/Meridian and Ngā Rūnaka; and
4. A suite of measures (including financial) that further provide for the management of adverse effects on Ngā Rūnaka with this Ngāi Tahu taonga.

The four components of this package recognise that restoration of the Waitaki Catchment requires time, capacity, commitment, collaboration and importantly

resourcing. This approach recognises Ngā Rūnaka rangatiratanga over the Waitaki Catchment and its taonga, including wai māori, and enables greater economic, spiritual and cultural connections for mana whenua.

Ngā Rūnaka understand that the replacement consents will enable the continued operation of the Waitaki Power Scheme for a 35-year term and that no material changes to the current activities and existing consent flexibility of the Waitaki Power Scheme are proposed.

The Genesis applications propose no material changes to the present Tekapo PS operation and matters identified by Ngā Rūnaka with respect to the proposed consent conditions are addressed in the proposed conditions in **Appendix D** which have been discussed with them. All other matters are addressed through the relationship agreement between Genesis and Ngā Rūnaka.

8.3 DEPARTMENT OF CONSERVATION

Genesis has discussed the application with, and reached agreement with DoC and Meridian regarding the continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment including the wetlands within the Waitaki Catchment, as described in sections 1.5.14 and 6.3 in this AEE. The indigenous biodiversity enhancement programme is discussed in section 6.3, the draft strategic plan (Kahu Ora) for the first 10-year period of the programme is provided in **Appendix E** and draft conditions requiring implementation of the biodiversity programme are included in the conditions proposed in **Appendix D**.

DoC has provided a letter of support for an application for replacement resource consents to enable the continued operation of the Waitaki Hydro Electric Power schemes. The letter notes that the agreement with Genesis and Meridian fully resolves DoC interests in the "*applications for replacement consents for the Waitaki power schemes*". A copy of the letter from DoC is included in **Appendix U**.

8.4 FISH AND GAME

Genesis has discussed the application with Central South Island Fish and Game Council ("**CSIFGC**") officers, with the discussion focussing on the operation of the Tekapo PS. Through this discussion, fish salvage measures have been developed in conjunction with Fish and Game. An agreement has been reached with CSIFGC regarding management and improvement of the sports fish and game bird resource affected by the Tekapo PS and a letter of support has been provided (included in Appendix U). The letter states that the application for replacement water and discharge consents, supported by the agreement, presents a comprehensive plan to manage and enhance the sports fish and

game bird resource within the Tekapo Catchment, noting that Genesis has shown a commitment to responsible environmental practices while ensuring a sustainable energy supply.

Conditions relating to sports fish salvage and other matters of interest to Fish and Game are incorporated into the proposed consent conditions in **Appendix D**.

8.5 TEKAPO WHITEWATER TRUST / WHITEWATER NEW ZEALAND

Genesis has discussed the application with the Trustees of the Tekapo Whitewater Trust / Whitewater New Zealand, focussing on the operation of the Tekapo PS and recreational releases of water.

Genesis has discussed the application with the Trustees of the Tekapo Whitewater Trust, and with Whitewater NZ Incorporated, focusing on the operation of the Tekapo PS and recreational releases of water. Through this discussion, Genesis has reached agreement with Tekapo Whitewater Trust / Whitewater NZ Incorporated on recreational matters. Conditions relating to recreational water releases are incorporated into the proposed conditions in **Appendix D**. A letter of support from the Trustees of the Tekapo Whitewater Trust and Whitewater NZ Incorporated is included in **Appendix U**.

8.6 MERIDIAN ENERGY

Genesis has consulted with Meridian on matters of mutual involvement regarding the combined WPS operations and where working with Meridian could achieve better environmental outcomes for the Waitaki Catchment.

8.7 MACKENZIE DISTRICT COUNCIL

Genesis has discussed the application with the MDC and the Tekapo Community Board, with the discussion focussing on the operation of the Tekapo PS and Takapō lake levels, noting that Genesis is not seeking any alterations to the current operational parameters associated with the ongoing operation of the Tekapo PS apart from an adjustment to the flood operating rules. A letter of support from the Council is included in **Appendix U.**

8.8 MOUNT COOK ALPINE SALMON

Genesis has discussed the application with Mount Cook Alpine Salmon who operate a salmon farming operation in the Tekapo Canal and has received a letter of support for the application. A copy of the letter of support from Mount Cook Alpine Salmon for applications for the "*renewal of its resource consent for its* [i.e., Genesis] *hydro canal/generation operation in the Tekapo canal*" is included in **Appendix U**.

8.9 NEW ZEALAND TRANSPORT AGENCY

The New Zealand Transport Agency ("**NZTA**", Waka Kotahi) is the requiring authority for State Highway 8, which crosses the Tekapo Canal near Irishman Creek.[221] State Highway 8 also crosses the Takapō gates (Gate 16), although the designation does not extend to the control gate structure itself.

Genesis has discussed the proposal to seek replacement resource consents to provide for the continued operation of the Tekapo PS with NZTA and a letter from NZTA is included in **Appendix U**. The letter states that NZTA considers that the proposed consents will not "impact on NZTA's ability to maintain and operate the state highway network" and provides NZTA support to the proposed replacement of resource consents to allow for the continued operation of the Tekapo Power Scheme to generate electricity for New Zealand.

8.10 TRANSPOWER NEW ZEALAND

Transpower is the requiring authority for designations TPR-2 (legacy designation 4) for the Takapō / Tekapo A Outdoor Switchyard and TPR-3 (legacy designation 5) for the Tekapo B Outdoor Switchyard under the MDP. The resource consents sought will not affect those designations (without the consents sought for the Tekapo PS, the switchyards would not be required).

8.11 LAND INFORMATION NEW ZEALAND

Land Information New Zealand ("**LINZ**") administers various Crown Property parcels in the vicinity of the Tekapo PS, including Takapō and the Takapō River over which Genesis holds operating easements. LINZ (for the Commissioner of Crown Lands) has provided a written approval for resource consent applications for:

i. A Water Permit to dam, take, divert and use water associated with the operation of the Tekapo PS; and

ii. A Discharge Permit to discharge water and associated contaminants associated with the operation of the Tekapo PS.

While the approval uses a CRC form typically used for written approvals for RMA consent processes, as the consents sought under the FTA are the same as those required under the RMA, the support expressed is relevant to this application also.

[221] Mackenzie District Plan designation NZTA-1 (Legacy Designations 22 and 77).

8.12 OTHER PARTIES

Genesis has discussed the application with numerous other parties at various times during preparation of the resource consent application and has confirmed that Genesis is not seeking any alterations to the current operational parameters associated with the ongoing operation of the Tekapo PS apart from an adjustment to the flood operating rules.

8.13 CANTERBURY REGIONAL COUNCIL

Genesis has discussed the application with CRC, with the discussion focussing on the operation of the procedure that would be followed for the application, the resource consent requirements, the existing environment and matters that could be included in consent conditions.

CRC previously issued a section 92 request for further information under the RMA in response to the resource consent applications lodged with CRC in 2023. The information requested has been considered in this assessment and addressed as appropriate, both in this AEE and in the appended technical reports. Changes made to consent conditions in response to comments from CRC are addressed in section 6.11 of this AEE.

9. CONCLUSION

Genesis owns and operates the Tekapo PS, which has an installed generation capacity of 190 MW and as part of the Combined WPS, provides up to 65% of New Zealand's hydro-electricity storage. The Tekapo PS has significant regional and national benefits. It is an important contributor to electricity generation from a renewable energy source and to the local and national economy. It is proposed that the operation of the scheme will align with the existing operational parameters and environmental conditions.

The Tekapo PS operates in accordance with a suite of resource consents granted by the CRC, some of which expire in April 2025. Genesis therefore needs to apply for new resource consents to allow the continued lawful operation of the Tekapo PS. In accordance with section 95 of the FTA, Genesis can continue to operate the Tekapo PS under the existing resource consents until this application under the FTA is finalised.

To replace the expiring resource consents authorising the Tekapo PS, Genesis is seeking the following resource consents:

1. **Water Permit** – To dam, take, divert and use water associated with the operation of the Tekapo PS; and

2. **Discharge Permit** – To discharge water and associated contaminants associated with the operation of the Tekapo PS.

The activities associated with the ongoing operation Tekapo PS are controlled activities under the WAP and CLWRP. As a controlled activity the resource consents must be granted. The broad powers under the RMA to impose conditions are constrained by the FTA. In considering the application:

1. Conditions can only be imposed for matters over which control has been reserved in national environmental standards, regulations or the CLWRP; and

2. The conditions must be no more onerous than necessary to address the purpose for which they are set; and

3. The purpose of the FTA must be given greater weight.

The actual and potential effects associated with the activities that are the subject of these applications have been considered in accordance with the matters to be considered under the FTA as well as sections 5, 6, 7, 104, 105 and 107 of the RMA. The proposed activities have also been assessed to be generally consistent with the relevant objectives and policies of the NPSREG, NPSFM, CRPS, WAP and CLWRP. Relevant iwi environmental management documents have also been considered.

Overall, it is concluded that with the agreements with Ngā Rūnaka, DoC and other parties, and the proposed conditions any more than minor adverse effects generated by the

proposal will be appropriately avoided, mitigated or compensated for. The assessments conclude that with the measures proposed by Genesis (in particular, the continuation of and increased funding for an indigenous biodiversity enhancement programme to work towards improving the condition, resilience, native biodiversity, ecological processes and other values of the braided rivers and associated environment within the Waitaki Catchment), the continued operation of the Tekapo PS can be undertaken in a manner that will sustain the current environmental values of the waterbodies influenced by the scheme.

Overall, reflecting the controlled activity status for the resource consents sought, there are no adverse effects from the operation of the Tekapo PS that are sufficiently significant to be out of proportion to the scheme's regional and national benefits and on that basis, the conditions are not more onerous than necessary, the Tekapo PS application satisfies the relevant tests under the FTA and accords with the purpose of the FTA as set out in section 1.2. The Panel can be satisfied that the resource consents can be granted on the conditions proposed.