QUEENSTOWN LAKES DISTRICT COUNCIL

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Resource Consent Application to Otago Regional Council for Discharge of Treated Wastewater & Associated Activities – Shotover Wastewater Treatment Plant

Prepared for Queenstown Lakes District Council

Project Name:	**Shotover WWTP Long-Term Discharge of Treated Wastewater**
Client:	Queenstown Lakes District Council
Document Name	Assessment of Environmental Effects
Date:	29 May 2026
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Cover photo: Taken by Dawn Palmer on 13 May 2026 from trig on Remarkables Skifield Access Road. The image is looking to the north across the Kawarau River and proposed discharge location with the previous disposal field and oxidation ponds visible in the background, with informal recreation areas along the Kawarau River banks, including self-formed motorbike tracks to the eastern end of the Delta.

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Abbreviations / Definitions

Complete mixing	The point in the river at which complete mixing of the treated wastewater discharge has been achieved
DAD	Dose and drain
EcIA	Ecological Impact Assessment
ESCP	Erosion and Sediment Control Plan
EMP	Environmental Management Plan
EO	Enforcement Order
FMU	Freshwater Management Unit
MALF	Mean annual low flow
MLE	Modified Ludzack–Ettinger
Near-field mixing area	Representing the water quality achieved in the immediate vicinity of the discharge structure.
NPS-FM	National Policy Statement for Freshwater Management 2020
NPS-NH	National Policy Statement for Natural Hazards 2025
NPS-I	National Policy Statement for Infrastructure 2025
NPS-IB	National Policy Statement for Indigenous Biodiversity 2023
ORC	Otago Regional Council
PORPS	Proposed Otago Regional Policy Statement 2021
QAC	Queenstown Airport Corporation
QMRA	Quantitative microbial risk assessment
QLDC	Queenstown Lakes District Council
Raw wastewater	Untreated wastewater
Reasonable mixing zone	The zone within which treated wastewater is dispersed through receiving waters and within which concentrations are less than the discharged treated wastewater but may be more than occurs for complete mixing of the discharge with the river.
Riverbed	Refer to Section 4.1
RPA	Regional Plan: Air for Otago
RPW	Regional Plan: Water for Otago
UV	Ultraviolet
Treated wastewater	Wastewater that has been fully treated via the WWTP
WCO	Water Conservation (Kawarau) Order 1997
WWTP	Wastewater treatment plant

1. Introduction

Queenstown Lakes District Council (QLDC – the applicant) is responsible for the conveyance, treatment and disposal of wastewater generated by the district in a manner that protects the health of its communities, the environment and is in accordance with the requirements of all relevant resource consents and legislation. The Shotover Wastewater Treatment Plant (WWTP) currently services the Whakatipu Basin communities of Queenstown, Arthurs Point, Frankton, Kelvin Heights, Quail Rise, Shotover Country, Lake Hayes Estate, Lake Hayes and Arrowtown (an average population of 50,000 people in 2024). Recent upgrades to the WWTP mean it can now receive additional wastewater from Jacks Point Village, Hanley's Farm, Ladies Mile and an extension of the Quail Rise residential development area (servicing a total projected average population of 70,000 people by 2040). Today, the WWTP produces around 12.5 million litres (equivalent to 5 Olympic swimming pools) of highly treated wastewater requiring disposal every day. Under current growth assumptions, this volume is expected to increase to 26 million litres (equivalent to 10.5 Olympic swimming pools) per day by 2060.

The currently-consented[1] disposal system for treated wastewater requires disposal through a Dose and Drain (DAD) field. Several non-compliances led to enforcement action from Otago Regional Council (ORC). Due to failures with the DAD disposal field, which led to ponding, and an increase in bird life on the DAD posing an immediate concern to Queenstown Airport Corporation (QAC) for safe aircraft operation, emergency works were undertaken on 31 March 2025 to commence the discharge of treated wastewater through a historic discharge channel under section 330 of the Resource Management Act 1991 (RMA).

An application was subsequently made to ORC in May, 2025, seeking resource consents authorising the ongoing adverse effects of the emergency works through short-term discharge of treated wastewater to the Kimi-ākau/Shotover River (RM25.206.01) as well as associated activities[2]. As at the time of writing this report, the application is currently subject to Environment Court proceedings as part of a direct referral process. Those consents and changes being sought, if approved as proposed, will expire on 31 December 2030.

In late 2025 a second Modified Ludzak Ettinger (MLE) reactor and another clarifier were added to the Shotover WWTP, which along with with additional upgrade works

[1] RM13.215.03.V2, RM13.215.01, 2008.238.V2, 2008.242.V1, 2008.243.V1, 2008.241

[2] Other activities include discharge of odour to air, works in the bed to install an outfall, works in the bed to create a diversion channel, diversion of water and discharge sediment associated with the construction and maintenance of the discharge channel (RM25.177.01, RM25.177.02, RM25.177.03, RM25.206.02, RM25.206.03)

cost approximately $50m. These upgrades allowed the decommissioning of the previous treatment pond system to commence. This upgrade delivered a step change in the wastewater treatment system at the Shotover WWTP (and a reduction in environmental effects from the discharge).

The present application is seeking resource consents to authorise the long-term disposal of treated wastewater from the WWTP to the Kawarau River, consistent with Enforcement Order (EO) ENV-2025-CHC-001[3]. These consents will enable the eventual transition of the WWTP disposal infrastructure from the consented but failed DAD disposal system, and the short-term Kimi-ākau/Shotover River emergency discharge, to a permanent, fit-for-purpose discharge system. The activities for which consent is sought are:

- Section 15 RMA - The discharge of treated wastewater into water and onto or into land where it may enter water, and the discharge of odour into air; and
- Section 13 RMA – Works to install and maintain an outfall structure and/or pipe in the bed of the river.
- Section 14 RMA – The taking of groundwater for dewatering during construction.

The ORC has statutory jurisdiction for the effects of the activity. The proposal requires resource consents for discretionary activities under the Regional Plan: Water for Otago (RPW) and Regional Plan: Air for Otago (RPA).

The following technical reports have been prepared by relevant experts and are attached as appendices to this application. These reports provide information and assessments that have informed the application so should be read alongside this AEE. They are:

- Shotover WWTP Surface Water and Groundwater Assessment, prepared by GHD – referred to as "GHD WQ Report" (Appendix A)
- Shotover WWTP Ecological Impact Assessment, prepared by Boffa Miskell – referred to as "EcIA" (Appendix B)
- Shotover Wastewater Treatment Plant Recreation Assessment, prepared by Thrive Spaces and Places – referred to as "Rec Report" (Appendix C)
- Shotover WWTP Landscape and Natural Character Effects Assessment, prepared by Boffa Miskell – referred to as "LNCA Report" (Appendix D)
- Shotover WWTP Odour Effects Assessment, prepared by Air Quality Consulting NZ – referred to as "Odour Report" (Appendix E)

[3] Clause 1.19.1 of the EO requires that an application for resource for a long-term solution must be lodged by 31 May 2026.

1.1 Background

The WWTP was originally constructed in 1974, to treat wastewater for the wider Queenstown area with a basic inlet works channel and three oxidation ponds. The plant has evolved significantly over time to both improve plant infrastructure, treatment and allow for the plant to cater for population growth in the Wakatipu Basin. Previous upgrades include:

- In 1987, an aeration septage lagoon and new inlet works were built.
- New inlet works were built in 2014 to replace the previous inlet works.
- Stage 1 upgrades (approximately $20m) were commissioned in 2017, including a grit removal system, a septage receiving facility, a MLE reactor with secondary clarifier, and ultraviolet (UV) disinfection. The oxidation ponds were retained to treat a portion of the incoming wastewater, and the wastewater streams were combined upstream of the UV for disinfection.
- Stage 2 upgrades (approximately $7.5m) were undertaken in 2019, which involved the implementation of a "disposal to land" scheme via rapid infiltration into the Shotover Delta gravels. This was known as the DAD field.
- Stage 3 upgrades (approximately $50m) were completed in late 2025 to accommodate growth in the Queenstown area. The upgrades added the second MLE reactor and another clarifier to increase the treatment capacity to a 2048 population forecast. The oxidation ponds have been decommissioned.

1.1.1 Recent WWTP upgrades

Following several years of works, QLDC have recently completed Stage 3 of upgrades to the plant, which include the addition of the second MLE reactor. As part of the works, a former oxidation pond (Pond 1) has been repurposed, partly to be used for stormwater management, and partly as a raw wastewater calamity pond in the event that the WWTP is forced offline.

The MLE process provides a significant improvement of wastewater treatment performance compared to the oxidation ponds. Recent completion of the second MLE reactor and clarifier has enabled the decommissioning of the oxidation ponds, which has already been shown via monitoring to have made significant improvements in treated wastewater discharge quality[4]. Following treatment via MLE reactor and clarifier, wastewater is UV disinfected prior to discharge to the Kimi-ākau/Shotover River.

[4] Refer to Section 2.5 below outlining the recent effluent quality results and improvement seen after the Stage 3 upgrades were completed.

Following the decommissioning of the oxidation ponds, repurposing of Pond 3 is now underway to establish a treated wastewater calamity pond if the level of treatment provided by the WWTP does not meet consent limits. This is due to be operational by 31 December 2027[5].

Figure 1, below, shows the WWTP and associated significant infrastructure.

[5] Clause 1.10 of the EO requires the treated wastewater calamity pond to be operational by 31 December 2027

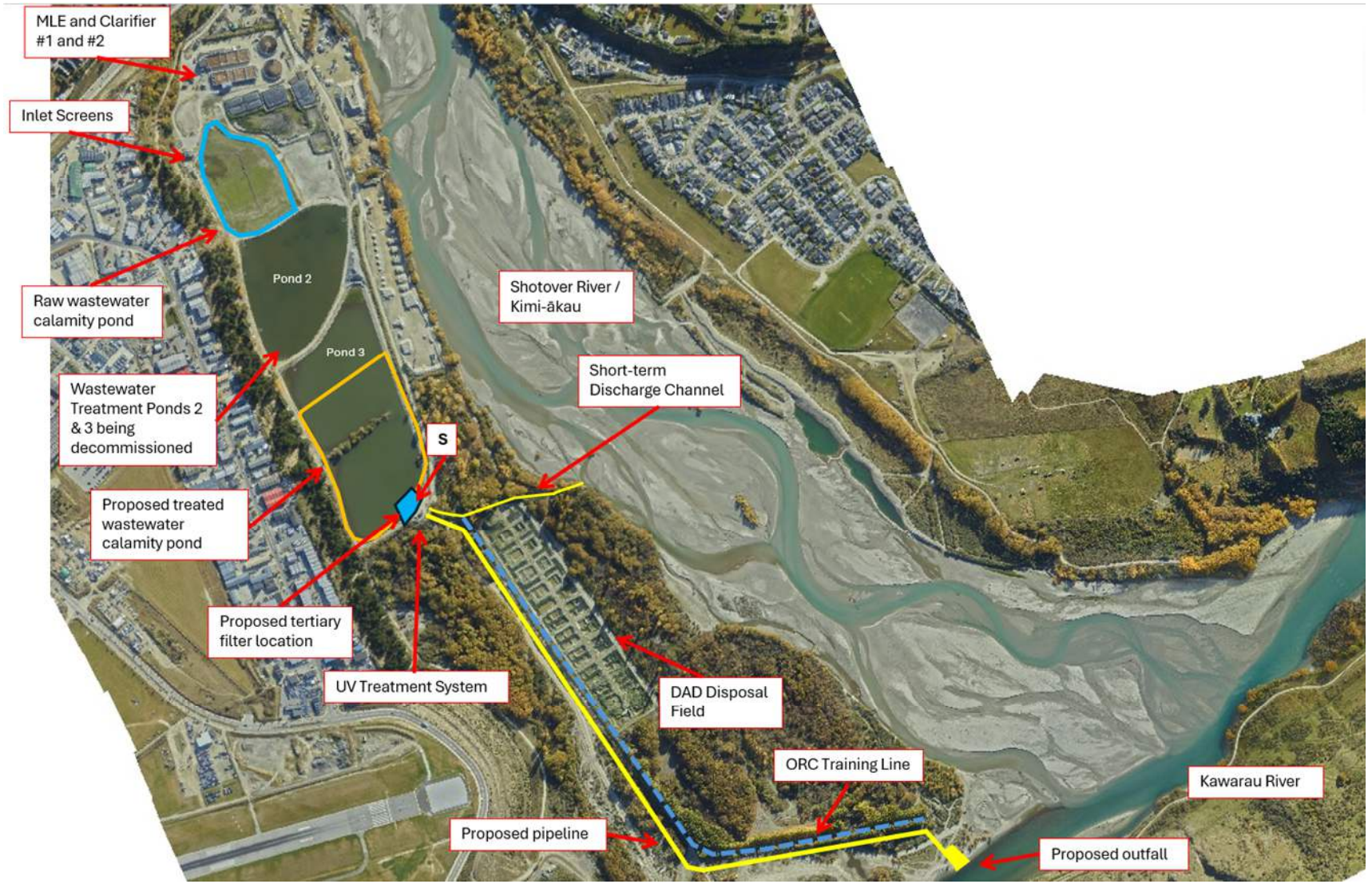

Figure 1: Site layout of Shotover WWTP (S = discharge sampling point)

1.1.2 DAD disposal field issues

In 2019, QLDC commissioned the DAD disposal field, enabling the cessation of direct discharges of treated wastewater to the Kimi-ākau/Shotover River. The DAD disposal field was originally made up of 11 individual soakage sectors, where treated wastewater was discharged to drain through the gravels into the water table below. The intent was to remove the direct discharge of treated wastewater to the Kimi-ākau/Shotover River, in part to address cultural effects of a direct discharge to water.

However, performance of the DAD disposal field steadily deteriorated from 2020, and the field no longer operated as it was intended, or in compliance with the current consent[6]. Since May 2024 this deterioration accelerated. Surface water within the DAD disposal field was unable to be fully contained, leading to ponding within and outside of the DAD and discharge from the southern end of the field and into the environment nearby. These events resulted in abatement notices being served by ORC on 27 May 2021 and 18 March 2024 for not complying with conditions of the governing resource consent (RM13.215.03.V1).

As the DAD disposal field deteriorated, QLDC undertook a series of investigative works to determine the cause of the problem and to identify potential options to resolve it. The investigations identified the following key problems with the DAD system:

- The discharge from the treatment plant (especially the pond stream) contained suspended solids that, over time, blocked the pores in the gravel soils reducing their permeability. In addition, biological growth occurred inside the DAD cells, reducing the ability of treated wastewater to discharge from the cells into the surrounding gravels. Further efforts to discourage the biological growth via hydrogen peroxide treatment, and to increase soakage capacity via additional infiltration basins, proved unsuccessful in resolving the issue.
- Groundwater beneath the delta is shallow and highly responsive to river flows, with groundwater levels frequently reaching or exceeding the ground surface during spring and high-flow periods in the Kimi-ākau/Shotover and Kawarau Rivers[7]. These conditions limit the underlying aquifer's ability to receive treated wastewater via discharge to the DAD disposal field, resulting in ponding of wastewater within the disposal field and eventual discharge of wastewater into the downstream environment.

[6] Refer to section 2.1.2 of the GHD Water Quality Report for further details.

[7] GHD, 2026: SWWTP Long Term Disposal Solution – Dose and Drain (DAD) Assessment.

1.1.3 Enforcement order

Due to the failure of the DAD system, an enforcement order was applied for by ORC in January 2025 and approved in June 2025 (Enforcement Order ENV-2025-CHC-001). The EO requires the development and implementation of a long-term wastewater disposal solution within the following timeframes, alongside a number of other interim measures. The key timeframes for a long-term solution in the EO are:

- Application for resource consent for the new disposal system lodged by 31 May 2026 (this application);
- Engineering design for the new disposal system completed by 31 December 2027; and
- New disposal system commissioned by 31 December 2030.

1.1.4 Emergency works

Due to the significant environmental issues and failures with the DAD disposal field, especially increased ponding that led to a rise in waterfowl numbers within the ponded areas and an associated bird strike risk for airport operations, immediate steps were taken to reduce this risk. As such, emergency works were undertaken on 31 March 2025 to commence the discharge of treated wastewater through a historic discharge channel to the Kimi-ākau/Shotover River under section 330 of the RMA.

A short-term (5-year) resource consent application to ORC for the ongoing adverse effects of the emergency discharge of treated wastewater to the Kimi-ākau/Shotover River was lodged in April 2025 and is currently being processed by ORC and the Environment Court by way of direct referral (as of May 2026).

1.2 Long-term wastewater disposal solution (assessment of alternatives)

Due to the ongoing failure of the DAD disposal field, in October 2024 QLDC commenced developing a new long-term disposal solution for treated wastewater produced by the WWTP. Optioneering for the long-term disposal solution is now complete, with the goal of replacing the currently consented long-term treated wastewater discharge to the DAD (and short-term emergency discharge to the Kimi-ākau/Shotover River) and providing for the community's wastewater disposal requirements out to 2060. QLDC's Long Term Plan (LTP) has allocated $77.5 million of funding for this long-term solution.

The optioneering process followed generally the below steps which are described in more detail in sections 1.2.1 and 1.2.2 below:

1.2.1 Options assessment process

An assessment of alternatives that commenced in late 2024 produced a long list of options for alternative discharge methods and locations. These options are summarised in the below table, with full details provided in GHD's *Long List Report* (Appendix F).

Table 1: Long list options and supplementary options considered for the Shotover WWTP alternative disposal solutions (Source: GHD, 2025)

Option				Supplementary options		
Disposal method		**Disposal Location**		**Subsurface wetlands on Delta**	**Re-use**	**Realignment of the floodwall**
Option 1	**High rate land disposal**	a)	Delta infiltration basins (requires smaller area)	Possible	Yes	Yes
		b)	Delta trenches (requires smaller area)	Possible	Yes	Yes
Option 2	**Moderate rate land disposal**	a)	Airport and vicinity area	No	Yes	No
		b)	Southern corridor	No	Yes	No
		c)	Alternate locations across the Shotover or Kawarau Rivers	No	Yes	No
Option 3	**Low rate land disposal**	a)	DOC land in vicinity of Coronet peak	No	Yes	No
Option 4	**Land flow path to river**	a)	Shotover	No	Yes	Yes
		b)	Kawarau	Yes	Yes	Yes
Option 5	**Deep well injections**	a)	Frankton	No	Yes	No
		b)	Bridesdale	No	Yes	No
Option 6	**Shallow well injections**	a)	Delta	No	Yes	Yes
Option 7	**Wetlands & land flow path to river**	a)	Kawarau	Included in option	Yes	Yes
Option 8	**Well points or soakage wells**	a)	Airport and surrounding area	No	Yes	No

The above long-list options were subjected to a preliminary assessment based on the following parameters:

- Technical complexity to build;
- Complexity of operation;
- Land area required; and
- Comparative cost range

The options were then exposed to a detailed review via multi-criteria assessment (MCA), which was undertaken by QLDC, Aukaha, Te Ao Marama Inc (TAMI), Landpro and GHD. The assessment was based on the following objectives and criteria:

Table 2: MCA framework summary (Source: GHD Short-list report)

	Criteria
Investment Objectives	IO1 - The health and well-being of the surrounding waterways are maintained, protected, and improved where practicable to support water quality.
	IO2 - The disposal of treated wastewater aligns with tikanga as guided by mana whenua.
	IO3 - Ability to service the community's and visitor wastewater needs now and into the future up to the equivalent flows projected for 2060.
Social and Environmental Factors	S&E1 - Mō tātou, ā, mō kā uri ā muri ake nei / For us and our children after us.
	S&E2 - Cultural impacts to sites of significance and access to sites for cultural activities.
	S&E3 - Impacts to the surrounding environment.
	S&E4 - Environmental impacts to surrounding catchment land, soil and groundwater.
	S&E5 - Visual effects.
	S&E6 - Amenity effects.
Critical Success Factors	CSF1 - Constructability and technical feasibility.
	CSF2 - Sustainability - Carbon emissions and sustainable use of resources supporting organisational goals.
	CSF3 - Operational reliability and maintainability.
	CSF4 - Property difficulties and impacts.
	CSF5a – Achievability of indicated outcomes.
	CSF5b – Consent, design, construction, and implementation timeline.
	CSF6 - Costs and affordability.

The results of the MCA for the long-list options can be found in GHD's *Long List Report* (Appendix F). At the conclusion of this process, the list was initially refined to five options (the "short list"), then reduced to 4 options following consideration of key assumptions, including land suitability and availability, wastewater quality requirements for re-use, and disposal capacity of bores and aquifers.

The four short-listed options are summarised in the below Table 3 and were subject to a further MCA assessment process (refer to the GHD Short-list Report for full scoring details – Appendix G). Through this process, Rūnaka, through their representatives from Aukaha and Te Ao Marama Inc, retained their position that they could not support any options that continue to rely on a discharge to the Kimi-ākau/Shotover or Kawarau River and therefore considered that each of these four options was unacceptable. Kāi Tahu papatipu rūnaka therefore provided a cultural position statement which is attached as Appendix H, rather than any scoring of the options.

A fifth option of a fully land-based solution (Option E) was also reintroduced ahead of the February 2026 Council workshop, but this was not included within the Short-

list report[8]. This option involves discharge to land at a remote location on the Crown Terrace and is discussed further in section 1.2.2.4 below.

At a Council workshop held on 19 March 2026, Council approved Option A as the preferred option for the Shotover WWTP long-term wastewater disposal strategy. The associated Council report[9] provides the following reasons for recommending Option A as the preferred option:

- Supports achieving the requirements of the Enforcement Order;
- Provides for long term (35 years plus) certainty around wastewater management in the Whakatipu basin;
- Can be accommodated within existing LTP budgets;
- Is the most cost-effective option and therefore complies with the cost effectiveness provisions of the Water Services (Local Government) Act 2025 (WSA)[10];
- Achieves appropriate environmental outcomes and supports moving away from the discharge to Kimi-ākau/Shotover River in shortest possible period;
- Ensures the utilisation of capital investment and expenditure in the Shotover WWTP to date is maximised; and
- Does not prevent any future adaptive pathways being pursued.

However, it was also acknowledged that Option A was inconsistent with Kāi Tahu views.

[8] Whilst not explicitly included in the Long-list report as an option, due to its distance and elevation from the Shotover WWTP, discharge to land in this area was within the catchment area considered in the land disposal assessment appended as Appendix G to the Short-list report (refer Figure 6 of that appendix).

[9] QLDC (2026): *Shotover Wastewater Treatment Plan (SWWTP) Disposal Solution – Report for Agenda Item for March 19th 2026 Council meeting.*

[10] As summary of the requirements under the WSA is provided in section 7.2.2

Table 3: Refined short list options summary (source: GHD Short List Report). Note this excludes the fifth option of a fully land-based solution (Option E) that was reintroduced ahead of the February 2026 Council workshop.

	Option A Land flow path to Kawarau	**Option B** Wetland + land flow path to Kawarau	**Option C** Boreholes at Frankton (+ Option B)	**Option D** Soakholes at Frankton (+ Option B)
Description	Discharge to water via land flow path to Kawarau River. Includes supplementary option of recycled water for reuse[11].	Discharge to water via a subsurface wetland and land flow path to Kawarau River. Includes supplementary option of recycled water for reuse.	Partial discharge to land via boreholes at Frankton with remaining flow to river via wetland. Includes supplementary options of recycled water for reuse and sports field irrigation Staged approach required.	Partial discharge to land via soakholes at Frankton with remaining flow to river via wetland. Includes supplementary options of recycled water for reuse and sports field irrigation Staged approach required.

[11] Note that the implementation of recycled water for reuse for dust suppression is currently on hold

1.2.2 Schedule 4 of the RMA

Schedule 4 of the RMA requires that an assessment of environmental effects must include a description of any possible alternative locations or methods for undertaking the activity if it is likely that the activity will result in any significant adverse effect on the environment and/or if the activity includes the discharge of contaminants. The discharge of treated wastewater to water described in this report is expected to result in significant adverse cultural effects, whilst the other associated activities are not likely to result in significant adverse effects, and so this assessment of alternatives considers the proposed discharge options only.

1.2.2.1 Alternatives to the discharge to Kawarau River

Commencing in 2024, a comprehensive optioneering process was undertaken, covering possible disposal methods and discharge locations, progressing from a broad long list of disposal methods and locations to a refined short list based on technical, environmental, cultural, and economic considerations[12]. The scope of this process was such that at the beginning of the project, a comprehensive list of possible options was developed for initial screening (refer to section 2.2.1 of the GHD Long-list Report). Constraints such as avoiding re-locating the current WWTP, distance from the Shotover WWTP, residential zones, geology, slope, water supply wells, surface water, funding availability[13], legislative standards, and other considerations were factored into the assessment.

This process included:

- Development of a long list of disposal typologies and locations (following the initial screening), incorporating land-based, groundwater, and river discharge options;
- Application of a multi-criteria assessment (MCA) framework incorporating environmental, technical, social, and cultural factors;

[12] Refer to reports attached in Appendix F and G

[13] A wide range of options were considered, but some options were deemed to be beyond the limits of funding available for this disposal project. The QLDC long term plan has set aside a budget of $77.5M based on previous indicative assessment undertaken by others. To enable a wide range of options for consideration, those options with estimated costs of up to approximately $150M were prioritised for further assessment. Select options with costs greater than $150M were considered where there was specific interest in understanding the cost of beneficial wastewater use and where these were required to consider low-rate land application of wastewater over a large area; a common wastewater disposal approach.

- Targeted land disposal feasibility investigations across a 25 km study area within proximity of the WWTP (refer to the additional disposal assessment in Appendix G of GHD Short-list Report);
- Refinement to a short list of practicable options, with further testing of fully land-based alternatives (refer to GHD Option E Addendum Report – attached as Appendix I).

Importantly, the process explicitly considered alternatives that include different receiving environments (land, groundwater, and surface water), not just different locations for river discharge.

The long-list assessment considered a comprehensive range of wastewater disposal alternatives spanning fundamentally different receiving environments, including land-based discharge, groundwater disposal, hybrid land–water systems, and discharge to surface water. These options were developed through a structured process involving desktop analysis, site investigations, and collaboration with technical specialists and iwi representatives, with the intent of capturing all reasonably practicable disposal typologies rather than focusing solely on location-based variations.

Land-based disposal options were explored in detail across high-rate, moderate-rate, and low-rate application regimes. High-rate systems (e.g. infiltration basins and trenches on the Shotover Delta) sought to maximise groundwater infiltration through engineered solutions; however, these are constrained by shallow groundwater levels and limited natural aquifer capacity. Moderate-rate land disposal options, including trench-based systems at Frankton Flats and other locations, rely on larger land areas and soil–plant processes to assimilate contaminants, but require extensive land areas and favourable hydrogeological conditions. Low-rate irrigation systems were also assessed, which offer the greatest degree of land contact and potential nutrient uptake, but require very large contiguous land areas and significant infrastructure to distribute flows.

In addition to land-based methods, groundwater disposal options were considered, including deep well injection, shallow injection, and soakholes. These approaches shift the receiving environment to groundwater systems, with the potential to avoid direct river discharge. However, they introduce uncertainty regarding long-term infiltration capacity, clogging, and potential effects on groundwater quality, and typically require even higher levels of treatment and ongoing monitoring.

Hybrid options were also identified, which combine land contact with eventual discharge to a river. These include land flow paths and constructed wetlands that

provide partial treatment or attenuation prior to discharge to the Kawarau River. While these options provide some improvement in terms of treatment and integration with the landscape, they still require discharge to surface water and therefore do not materially alter the fundamental receiving environment.

Several options were discounted at an early stage due to clear constraints. These included direct discharge to water without prior land contact[14] (on cultural and social grounds), spray irrigation (due to climatic limitations in winter), wastewater disposal within sensitive catchments (e.g. Lake Hayes due to nutrient enrichment effects), relocation of the treatment plant (due to cost and existing investment) and advanced treatment options such as potable reuse (due to extreme cost and complexity).

1.2.2.2 Land Disposal Feasibility

The feasibility of land-based disposal was examined in detail through a dedicated spatial and technical assessment (Appendix G of GHD Short-list Report (attached as Appendix G)) that considered environmental, geotechnical, planning, and infrastructure constraints across a wide study area. This assessment identified wastewater disposal to land as the preferred approach from a cultural perspective, reflecting the importance of restoring the mauri of wastewater through land contact. However, the findings demonstrated that the physical and logistical constraints of the Wakatipu Basin significantly limited the viability of this approach at the scale required for long-term disposal.

The assessment confirmed that suitable land for wastewater disposal is both limited and fragmented, with much of the study area constrained by geology, topography, proximity to water bodies, existing land use, and infrastructure. Even where potentially suitable land exists, additional constraints such as distance from the treatment plant and elevation changes substantially increase capital and operational costs, further reducing feasibility.

From a technical perspective, the suitability of land disposal methods varies significantly depending on the application rate. High-rate systems require highly permeable ground conditions and sufficient separation from groundwater, conditions that are generally not available in their natural state and would require engineered solutions. Moderate-rate systems are more flexible but require substantial land areas (on the order of tens of hectares) and suitable soil conditions, while low-rate systems require very large land areas (in excess of

[14] However, as development of the outfall design and effects assessment has progressed, providing for suitable mixing has dictated the need to pipe the outfall through to the higher velocity flows in the Kawarau River, removing the land contact through the rock outfall, albeit a rock outfall is still proposed (refer section 1.2.2.6 for further detail).

several hundred hectares), which are not available within practical proximity to the treatment plant.

Importantly, the assessment concludes that no feasible land-based disposal option has been identified that can reliably accommodate the projected future wastewater volumes on a standalone basis, when including consideration of cost for the community and ease of obtaining access to such land. This conclusion reflects a combination of hydrogeological limitations, land availability constraints, and the scale of infrastructure required. As such, while land disposal remains conceptually desirable, it cannot be implemented at the scale necessary to fully replace discharge to surface water. Further comment on the Option E land disposal to the Crown Terrace and associated constraints is provided in section 1.2.2.4.

1.2.2.3 Continued use of the DAD

The detailed DAD assessment (Appendix J) provides an assessment of the feasibility of the currently consented land-based disposal on the Shotover Delta.

While the DAD system was originally intended to provide full discharge to ground, its operation demonstrated significant and persistent constraints, including clogging of disposal media, limited infiltration capacity, and groundwater mounding leading to surface ponding and uncontrolled discharges. These issues reflect fundamental limitations of the receiving environment, rather than solely design or operational shortcomings.

The underlying hydrogeological conditions of the delta are now understood to be a primary constraint. Investigations confirm shallow groundwater levels, strong hydraulic connectivity with river flows, and spatial variability in permeability, including low-permeability sand and silt layers that restrict vertical infiltration. During high river flow conditions, groundwater levels can rise to or above ground surface at the lower end of the Delta close to the Kawarau River, effectively eliminating the capacity to discharge wastewater to ground without causing surface breakout.

Quantitative analysis indicates that even under favourable (low groundwater) conditions, the achievable disposal capacity is limited to approximately 3,000–5,000 m^3/day, which is substantially below current (12,500 m^3/day) and projected 2060 (26,000 m^3/day) average wastewater flows. Moreover, this capacity is highly seasonal and cannot be relied upon during extended periods (particularly spring), when no effective infiltration capacity is available.

Importantly, the DAD assessment also identifies limited in-ground treatment of contaminants, with groundwater quality downgradient of the DAD showing nutrient concentrations comparable to treated wastewater and measurable effects on river water quality along the delta margin. This further constrains the viability of

continued use of the DAD, as it indicates that the anticipated treatment benefits of soil–aquifer processes are not realised in this environment.

Overall, this evidence confirms that disposal to land via the DAD on the Shotover Delta is not capable of accommodating the required wastewater volumes on a continuous basis, does not provide sufficient additional treatment before entering groundwater and, at best, may provide a very limited and intermittent discharge pathway when combined with an alternative disposal method.

1.2.2.4 Short-List Alternatives

Following refinement of the long list, a reduced number of technically feasible options were carried forward for more detailed assessment. These short-listed alternatives represent the range of practicable approaches capable of meeting project objectives within identified constraints, while still encompassing both river-based and partially land-based solutions.

Two primary options involved discharge to the Kawarau River via different forms of land contact. Option A comprises a land flow path to the river, providing limited passive treatment prior to discharge, while Option B incorporates a subsurface constructed wetland before discharge, offering additional treatment and potential ecological and amenity benefits. Both options retain discharge to surface water as their primary receiving environment, but differ in the degree of pre-treatment and land interaction.

Two further options (Options C and D) were developed to explore the potential for increased land-based disposal at Frankton Flats through boreholes and soakholes, respectively. These options were conceived as hybrid systems, combining partial discharge to land with residual discharge to the river. The design of these options incorporates staged implementation, reflecting the uncertainty in achievable disposal capacity and the need for field trials to confirm performance.

However, further assessment determined that land-based components in these options could not accommodate the full wastewater volume required. As a result, Options C and D both rely on continued discharge to the Kawarau River for a significant proportion of flows. The technical feasibility of these options is therefore contingent on their integration with river discharge, rather than providing a standalone alternative.

In response to cultural concerns, a fully land-based disposal option (Option E) was also evaluated at a high level and included in the short list. This option involves discharge to land at a remote location on the Crown Terrace (at a considerably greater elevation) requiring extensive conveyance infrastructure (15 km and 360m elevation gain) and large land areas (approximately 288 ha). While this option performs well in terms of avoiding discharge to surface water, it introduces significant challenges including extreme capital costs in the range of $575m to

$675m, high operational requirements (in the order of $5m/year), and expected difficulty in acquiring private land to enable piped access and the disposal field.

To assist in understanding the implications of this level of capital cost for ratepayers, a high-level assessment of the rates impact has been undertaken in comparison against the current LTP budget of $77.09m. Option E has an estimated Net Present Value circa $671M to $771M. At that level, this would represent a rates impact of up to $1,300 (160%) to $1,500 (180%) per annum for each ratepayer in the district, and a development contributions increase of $28,400 to $32,600 per dwelling equivalent (versus $3,800 against the LTP budget), demonstrating its financial infeasibility. The table below outlines the rates and development contributions impact across the various short-listed options.

Table 4: Net present value, rates impact and development contributions increases for short listed options

	Option A	Option B	Option C	Option D	Option E	
	Rock outfall	Wetland	Bores	Soakholes	Crown Terraces	
NPV (Circa)	$48M	$85M	$188M	$209M	$671M	$771M
Rates Impact[15] (P/A) up to	$98 / 12%	$170 / 21%	$360 / 44%	$400 / 49%	$1300 / 160%	$1500 / 180%
Development Contributions Increase	$2,100	$3,900	$7,800	$8,600	$28,400	$32,600

1.2.2.5 Treatment options

Following the decision to proceed with the option of discharge to the Kawarau River, further assessment has also considered enhanced treatment options as part of the overall alternatives framework.

A range of enhanced treatment options to improve nutrient and pathogen removal beyond the current WWTP operation were considered, including reconfiguration of the treatment process to a 5-stage biological nutrient removal system or membrane bioreactor (MBR), using membrane filtration in lieu of tertiary filters, as well as supplementary chemical dosing (carbon and alum) and enhanced disinfection via ultraviolet (UV) systems.

As illustrated in the photo below (Figure 2) and the sampling results (in Table 8 and

[15] Note the percentage rates increase identified is against the wastewater component of rates, not a percentage increase of the total rates.

Table 9), the current treatment process produces a good quality final treated wastewater at the UV outlet, when compared against other treatment plants around the country, in terms of E.coli, BOD_5, TSS and nitrogen removal performance. Hence, major process reconfigurations such as membrane bioreactor (MBR) and conversion to 5-stage biological nutrient removal (BNR) plant upgrades were not progressed due to high capital cost in the range of $30m to $55m (in addition to the recently-completed $50m Stage 3 upgrades) and operational complexity, while more incremental upgrades (e.g. tertiary filtration, chemical dosing, UV disinfection) were identified as feasible enhancements to the preferred option rather than standalone alternatives.

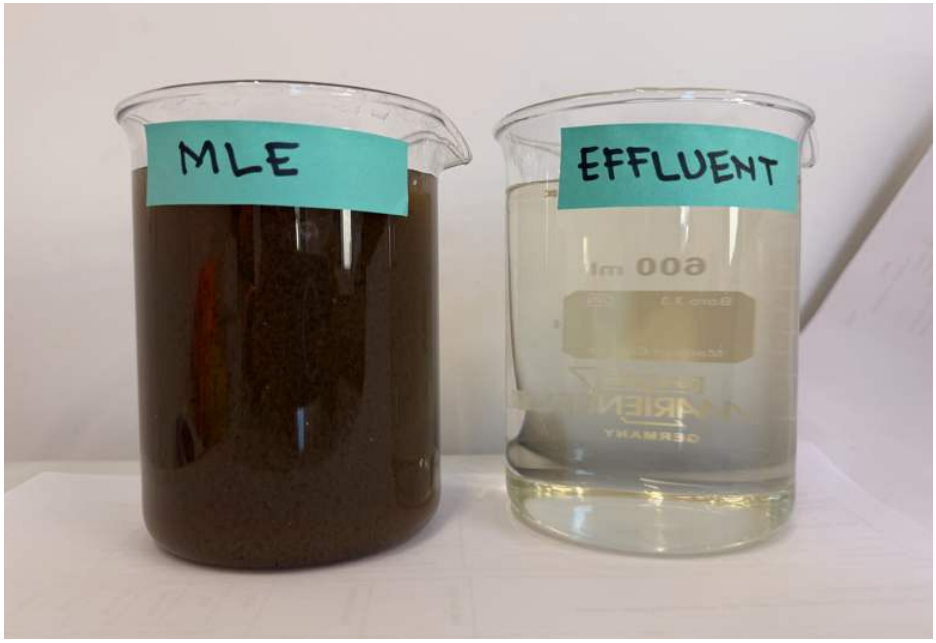

Figure 2: Photo illustrating wastewater clarity, with samples taken from the biological secondary treatment process marked as "MLE" (note this is darker than raw wastewater) and post-UV treatment marked as "Effluent" (Source: Veolia)

Advanced water treatment options such as reverse osmosis or additional treatment steps such as ozone were also assessed at a high level. They were not progressed for further consideration for similar reasons. These options would also introduce significant technical complexity on issues such as brine management disposal pathways, and therefore are not considered reasonably practicable for the Shotover WWTP in its current context.

Following the assessment of alternative treatment options, and in consideration of the benefit they would provide in further avoiding or mitigating effects on the receiving environment in respect of water quality, public health, ecology, recreation and cultural values, the following additional treatment options are now part of this proposal (refer to Section 2.4 for more details):

- Chemical dosing for improved phosphorus removal;
- Tertiary filtration to reduce suspended solids and improve UV performance, particularly in terms of consistency; and
- Enhanced UV disinfection with higher energy intensity for virus reduction.

A treated wastewater calamity pond for under-treated wastewater to be temporarily stored then re-treated is also currently being designed and due to be implemented by December 2027.

1.2.2.6 Outfall options

In parallel to the alternative treatment options, alternative discharge configurations to surface water were considered, including different outfall typologies (rock outfall/land flow path vs pipe/submerged diffuser). These do not change the receiving environment but represent different approaches to mixing, dilution, and interaction with the river. Accordingly, they form part of the consideration of alternatives, recognising that the method of discharge can influence environmental effects even where the receiving environment remains the same.

The primary disposal pathway for all short-listed options remains discharge to the Kawarau River; however, the method of discharge has been developed further through consideration of three distinct outfall approaches:

1. Rock outfall / land flow path discharging into river edge: involving discharge via a rock-filled channel across the delta, providing for some limited land contact and near-bank mixing within the river. Key outfall method originally forming part of the preferred option.
2. Rock outfall discharging into higher-velocity flows: involving a rock-armoured structure with pipes to discharge out to deeper, faster-flowing water to avoid near-bank mixing and achieve higher dilution.
3. Submerged pipe/diffuser outfall: involving discharge through a multi pipe arrangement, or single pipe, with or without diffuser within the main river channel to promote rapid mixing and achieve higher dilution.

Option 1 compared with 2 and 3 represent materially different approaches to achieving dilution and managing environmental effects. Options 2 and 3 are specifically designed to achieve enhanced dilution (5-fold by the end of the discharge structure (i.e. 40m downstream) and 50-fold by the end of the reasonable mixing zone), thereby improving mixing and reducing near-field concentrations, whereas Option 1 relies on passive dispersion and may result in lower dilution and greater interaction with the river margin.

Due to the ability to provide better mixing and avoid adverse effects in the near-field river margins, an outfall using Option 2 or 3 is proposed, with further detailed design required to determine the preferred approach. Consent is therefore sought to allow for both Option 2 or 3 at this present time.

1.2.2.7 Key Conclusions

The assessment of alternatives undertaken through the optioneering that has led to this proposal, and through further evaluation of potential mitigations as part of further developing this option, demonstrates that a wide range of disposal methods and receiving environments have been considered. The findings consistently indicate that while land-based disposal is strongly preferred from a cultural perspective, it is not practicable and cost-effective at the scale required to accommodate current and future wastewater flows.

Re-use of the DAD is subject to hydrogeological constraints limiting discharge capacity to a relatively small proportion of total flows, with strong seasonal variability and demonstrated risks of surface breakout and environmental effects.

Groundwater disposal options offer some potential to reduce reliance on surface water discharge; however, these approaches are characterised by significant uncertainty regarding long-term performance and capacity, and cannot operate as standalone solutions. As such, they do not represent a complete alternative to discharge to surface water, but rather a supplementary measure.

Hybrid options, including wetlands and land flow paths, provide incremental improvements in treatment and environmental performance, but do not fundamentally alter the receiving environment, as they still result in discharge to the Kawarau River. Kā Rūnaka advised during the optioneering process that locating these options on the Delta would still be considered too close in proximity to water to have the benefits they otherwise might. These options therefore do not address the core cultural concerns associated with discharging treated wastewater to natural water bodies.

The evaluation of a fully land-based option confirms that, although such an approach would avoid discharge to surface water, it is not practicable nor cost-effective due to the scale of land required, the significant capital and operational costs, and the logistical challenges associated with implementation.

Enhanced treatment options can improve wastewater quality, including reductions in nutrients and pathogens, and may reduce environmental effects associated with discharge. However, these measures do not provide an alternative receiving environment and therefore do not remove the need for discharge to surface water. In addition, higher-order treatment options (such as treatment for reuse as drinking water) involve significant cost and complexity and are not considered reasonably practicable as standalone solutions.

Alternative outfall configurations demonstrate that, while discharge to the Kawarau River remains necessary, the method of discharge can materially influence environmental outcomes, particularly in terms of mixing and dilution. The options to discharge to higher velocity flows provides improved dilution and reduced near-field effects, whereas the pure rock outfall offers lower cost but reduced mixing performance.

Overall, the evidence demonstrates that all practicable and cost-effective disposal options either rely on discharge to the Kawarau River or require this as a component of the system. Consequently, while incremental improvements are available and proposed through enhanced treatment and optimised discharge configuration, there are no feasible alternatives that avoid discharge to surface water while meeting the scale, reliability, and environmental performance required for the long-term wastewater management of the Whakatipu Basin.

2. Details of proposal

2.1 Summary of proposal

Resource consent is being sought for the discharge of treated wastewater to the Kawarau River via a treated wastewater discharge pipeline and outfall. Wastewater will be treated via inlet screens and grit removal, secondary treatment via dual MLE and clarifiers, then final treatment via tertiary filtration and enhanced UV disinfection.

Resource consent is also being sought for discharge pipeline and rock outfall installation works in and on the riverbed and the associated discharge to air associated with the operation of the WWTP.

Consent is sought for a duration of 35 years.

2.2 Location

The Shotover WWTP is located on the true right bank of the Kimi-ākau/Shotover River, downstream from the State Highway 6 bridge, within the Shotover Delta.

The site layout is shown in Figure 1, above, with the locality in the wider basin illustrated in Figure 3. An overview of the proposed wastewater discharge pipeline and rock outfall is provided in Figure 4(full-size copy provided in Appendix K along with the full drawing set).

Figure 3: Location of Shotover WWTP within the wider area shown with red circle and location of proposed outfall within yellow circle (imagery from Google Maps)

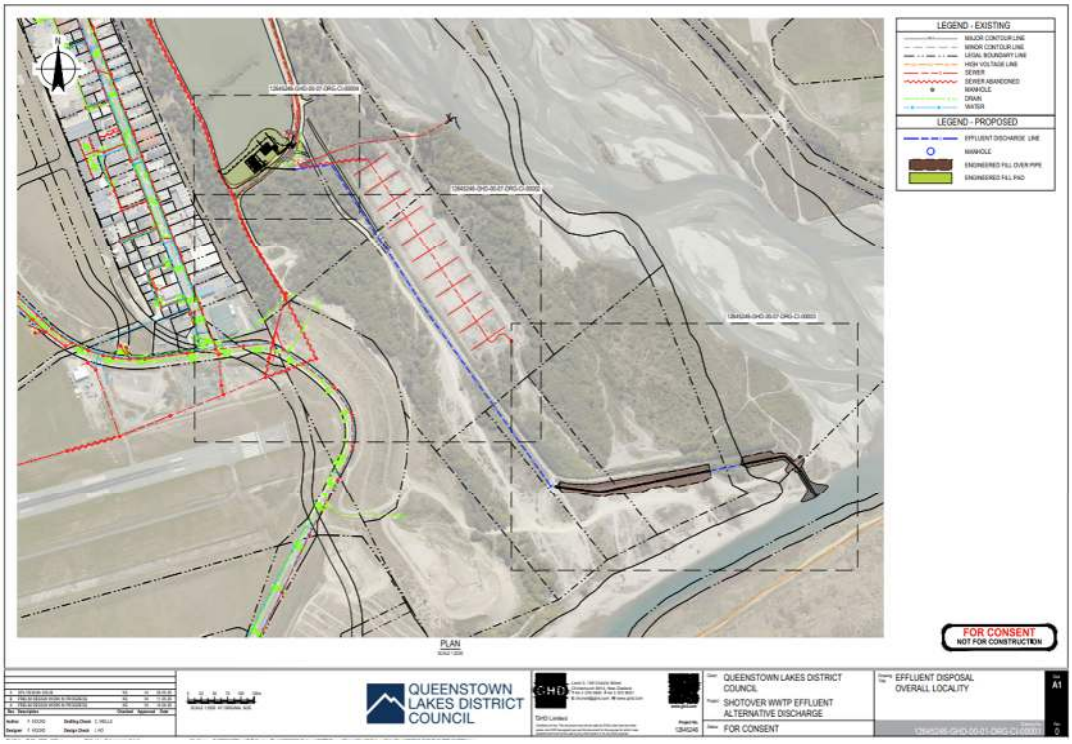

Figure 4: Treated wastewater disposal infrastructure overview (Source: GHD, 2026, see Appendix K)

2.3 Existing resource consents

The following current or expired consents, issued by ORC and held by QLDC, relate to the wider Shotover WWTP operations.

Table 5: ORC consents granted to QLDC for Shotover WWTP-related activities

Consent no.	Purpose	Status
Discharge of treated wastewater to land		
2008.238.V2	To discharge treated wastewater to land for the purpose of operating the Queenstown Wastewater Treatment and Disposal System.	Expires 18/3/2044
RM13.215.03.V2	To discharge treated wastewater to land for the purpose of operating the Queenstown wastewater treatment plant. *Note: Due to be surrendered. See explanation below.*	Expires 31/12/2031
Discharge of odour		
RM13.215.01	To discharge contaminants to air for the purpose of operating the Queenstown wastewater treatment plant *Note: As of May 2026, subject to application for replacement by RM25.206.03.*	Expires 18/03/2044
Construction of disposal field		
2008.242.V1	To place a structure on the bed of the Shotover River for the purpose of constructing a low pressure wastewater dosing system.	Expires 02/12/2030
2008.243.V1	To disturb the bed of the Shotover River for the purpose of gravel and vegetation removal, depositing gravel as well as constructing a low pressure wastewater dosing system	Expires 02/12/2030
2008.241	To disturb the bed of the Shotover River for the purpose of removing and depositing gravel. Specific location for works: True right side of the Shotover River Delta, approximately 1.1 kilometres south east of the intersection of Glenda Drive and Margaret Place	Expires 02/12/2030
Decommissioning of oxidation ponds		

Consent no.	Purpose	Status
RM23.501.01	To discharge leachate to land in a manner that may enter water for the purpose of repurposing and permanently storing sludge solids	Expires 03/08/2038
Investigation activities		
RM25.123.01	To drill 11 wells for the purpose of groundwater investigation and monitoring	Expires 21/03/2028
Relevant expired consents to discharge to Shotover River		
RM13.215.02	To discharge up to 15,900 m3/day of treated wastewater to water at a rate of up to 352 L/s	Expired 28/02/2017
RM13.215.04	To discharge up to 17,000 m3/day of treated wastewater to water at a rate of up to 415 L/s	Expired 31/12/2022

Consent RM13.215.03.V2 authorises the discharge of treated wastewater to land until 31st December 2031, however Condition 4(b) requires the surrender of this consent within 6 months of WWTP upgrades required for receive and treat ≥75.5 tonnes/year nitrogen to the standards set in Consent 2008.238.V1 (now V2). As these upgrades have been completed, RM13.215.03.V2 has effectively been superseded by 2008.238.V2, which has now commenced and is being complied with in respect of wastewater quality requirements, albeit that the discharge via the DAD is not occurring.

Consent 2008.238.V2 authorises the discharge of treated wastewater to land up until 18 March 2044. Compared to RM13.215.03.V2, 2008.238.V2 provides for an increased discharge volume of up to 45,000 m3/day, and discharge quality limits as presented in the following table (extracted from Condition 3).

Table 6: Consent 2008.238.V2 discharge quality limits

Parameter	Annual mean not to exceed	90th percentile not to exceed
Five day biochemical oxygen demand (grams per cubic metre)	10	20
Total suspended solids (grams per cubic metre)	10	20
Total nitrogen (grams per cubic metre)	10	15

Parameter	Annual mean not to exceed	90th percentile not to exceed
Total phosphorous (grams per cubic metre)	8	10
E.coli (colony forming units per 100 millilitre)	10 (geometric mean)	100 (95th percentile)

While consents RM13.215.03.V2 and 2008.238.V2 are not currently being implemented as intended (due to performance issues with the DAD disposal system), there are ongoing effects on the groundwater and surface water environments that have been directly correlated to the exercise of consent RM13.215.03.V2 as it was intended. These effects form part of the existing environment. In addition, under s330A(3) of the RMA, any emergency works activity (and the effects arising from those works) "*may continue until the application for a resource consent and any appeals have been finally determined*", therefore the discharge to the Kimi-ākau/Shotover River is lawfully occurring at present and as such, is part of the existing environment. In particular, this applies to the environmental assessments undertaken, whereby the influence of the existing discharges, as part of the environment, is being assessed and cannot practically be excluded.

As part the short-term RM25.206 application, ORC considered that a new consent rather than a variation to the existing air permit (RM13.215.01) was necessary to authorise the discharge of odour to air from the historic Kimi-ākau/Shotover River discharge channel. Once granted, RM25.206.03 will not replace RM13.215.01, but instead operate in conjunction with it, and includes the following requirements (based on proposed draft conditions as of May 2026):

- Update to the odour management plan prepared for RM13.215.01.
- 2-yearly reporting on odour performance for the WWTP and discharge channel.
- Walkover surveys upon receipt of odour complaints relating to the discharge channel or Kimi-ākau/Shotover River outfall.

Copies of the two active discharge consents relating directly to the ongoing WWTP operations are attached in Appendix L.

2.3.1 Relationship between this application and existing consents

Within one month following the first exercise of the consents granted under this long-term consent application, it is proposed that current discharge to land consent 2008.238.V2 and current discharge to air consent RM13.215.01 will be surrendered.

2.4 Wastewater Treatment Process

The Stage 3 upgrade of Shotover WWTP was completed in late 2025. The current treatment process comprises the following stages:

- Preliminary treatment – inlet screens and grit removal.
- Secondary treatment – via two bioreactor tanks of MLE arrangement to achieve biological nutrient removal. The microbes (mixed liquor) are separated by two secondary clarifiers and returned back to the bioreactor tanks.
- UV disinfection – provides for disinfection and virus removal with a current capacity up to 2040 based on recently revised population projections.
- Raw wastewater calamity pond (RWCP) – this was constructed as part of the Stage 3 upgrade.
- Sludge management – two centrifuges for mechanical dewatering of biosolids generated from the secondary treatment process and filtered solids from tertiary filters.

While not part of the treatment process, the Stage 3 upgrades also resulted in the creation of an emergency raw wastewater calamity pond capable of holding approximately 21,000 m^3 untreated wastewater.

Through the development of the discharge solution, further additional treatment upgrades are proposed as follows and described further in sections 2.4.1 to 2.4.4:

- Treated wastewater calamity pond (TWCP) - this is being designed at present, for construction and due to be operational by December 2027. QLDC is undertaking this as a separate project to comply with the EO timeframe.
- Tertiary Filtration – Tertiary filters will remove fine solids and solids-bound contaminants in the secondary clarifier effluent. The tertiary filters will be situated in on an engineered fill platform within the former Pond 3, which is to be re-purposed as the TWCP.
- UV disinfection – The existing UV system will be replaced by a new UV system which provides higher treatment capacity and higher degree of virus disinfection (however details of exactly what this enhancement looks like are still to be confirmed). The new UV system will be sited in a new building adjacent to the tertiary filters. The existing UV system would be decommissioned.
- Supplementary chemical dosing – poly aluminium chloride (PACL) or aluminium sulfate will be used to reduce phosphorus species in the plant discharge.

The Stage 3 MLE and clarifier expansion was designed to accommodate the catchment growth up to 2048. A further capacity upgrade will be required within the consent duration when this capacity is reached. This could be in the form of additional trains (e.g. MLE3) or process intensification, with the exact upgrade requirements and design being developed in future to meet the same discharge standards as proposed in this application.

The existing Shotover WWTP with the addition of the planned upgrades is outlined in the process schematic in Figure 5.

2.4.1 Treated Wastewater Calamity Pond

The Enforcement Order requires the construction and operation of a TWCP be completed by 31 December 2027. The calamity pond will require decommissioning of the existing oxidation pond 3, including sludge removal, reshaping of the pond base, and topsoil spreading with grass seeds (covered by consent RM23.501.01).

This calamity pond (TWCP) will be kept dry most of the time. In situations where the treatment process isn't working as expected and poor quality wastewater would otherwise be discharged, partially treated wastewater will instead be diverted into this pond. Any temporarily stored treated wastewater will be returned back to the WWTP inlet works for re-treatment, or for discharge to the downstream UV.

QLDC is undertaking the design and construction of TWCP as a separate project to this long-term wastewater disposal project. The TWCP pond will have a minimum storage volume of 53,000 m^3. This volume excludes freeboard and any allowance for residual sludge, which will be addressed during detailed design. The pond volume is intended to provide a minimum of 48 hours duration of the 2060 ADF flow.

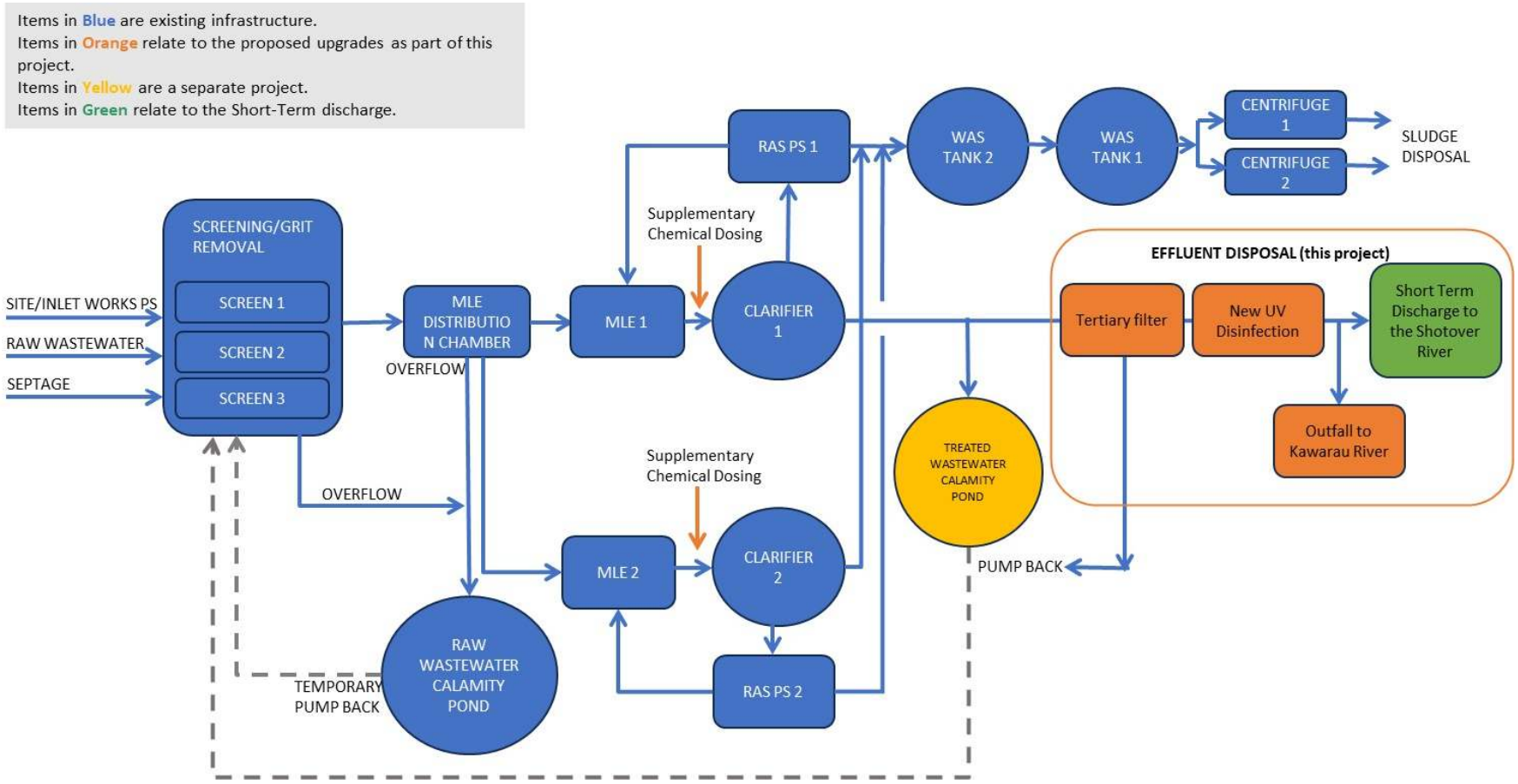

Figure 5: Shotover WWTP Process Schematic. Blue = existing consented; Orange = proposed upgrades; Green = short term discharge (Source: GHD, 2026)

2.4.2 Tertiary filtration

The new filtration system will include a tertiary filter pump station and tertiary filters .

Tertiary filtration plays a significant role in reducing fine suspended solids prior to UV disinfection. Pile cloth media disc filters have been selected as the preferred option for its robustness (e.g. outside in flow pattern) and longevity. It is widely used overseas for similar tertiary filtration applications.

The tertiary filters will be sized to achieve median and 90%ile total suspended solids (TSS) limits of 5 and 10 mg/L respectively. The filter media nominal pore size is 10 um, however the pile cloth on the media surface traps more fine solids for depth filtration, further enhancing the filtration efficiency and suspended solids removal.

A new pump station will be installed to continuously transfer secondary clarifier effluent into the tertiary filters. There is also a provision for controlled diversion of flows into the treated wastewater calamity pond under abnormal or fault conditions.

There will be three tertiary filters to handle the maximum discharge volume of 60,000 m^3/day sought by this consent application. A space provision has been made for a fourth tertiary filter, for future expansion or additional process redundancy. The filtered wastewater will be directed to the downstream UV system for disinfection.

Solids captured by the filters as filter backwash/sludge stream will be returned to the WWTP for treatment.

The tertiary filters will be operational by 31 December 2028. This is likely to mean that the tertiary filters will be delivered ahead of the long-term disposal consent commencement date.

Figure 6: Example figure of tertiary filter installation (online photo, from WaterProject)

2.4.3 Enhanced UV Disinfection

Filtered wastewater will pass through the new enhanced UV system for disinfection, particularly for virus removal (with details of the degree of enhancement still to be confirmed). The existing UV system which originally was sized for a smaller capacity and for *E.coli* disinfection will be decommissioned.

The UV reactors will be installed in a building, with a much higher dose rate for achieving up to 2 log virus removal. The log removal requirement will be subjected to findings of the QMRA assessment.

This type of UV reactor is used for drinking water (for taste and odour treatment) and recycled water, and a high-quality wastewater feed (i.e. low in TSS) is necessary for the UV reactors to operate effectively. Online water quality analysers will be installed to monitor the filtered wastewater quality in real time.

Two reactor units will be required to meet the peak discharge volume of 60,000 m3/day in 2060. A space provision in the new building will be made for a future third UV reactor.

Virus removal certification will be supplied by the manufacturer, and these certifications are based on meeting the target dose specified in USEPA[16] or other guidelines.

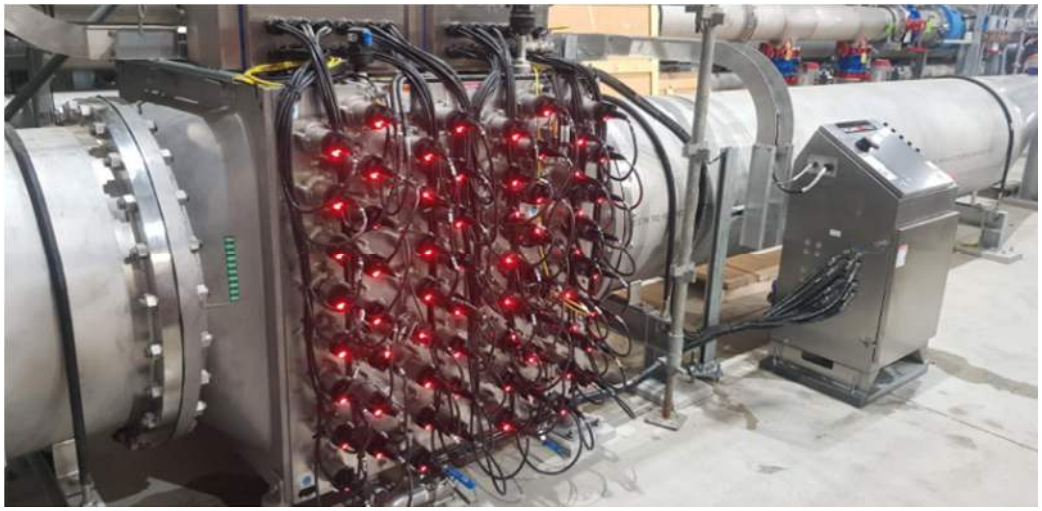

Figure 7: Example UV Reactor installation (from vendor website)

2.4.4 Supplementary Chemical Dosing for Phosphorus Removal

The existing MLE bioreactor configuration is a well-established secondary treatment process, for excellent removals of total nitrogen and ammoniacal nitrogen with moderate phosphorus removal. To comply with the dissolved reactive phosphorus limit in the short-term consent (expires in December 2030) and the proposed limits in this

[16] USEPA (2022) *Ultraviolet (UV) Treatment Toolkit: Technical Resource for States using EPA's Ultraviolet Disinfection Guidance Manual to Evaluate UV Technology.* EPA 815-B-21-007

long-term consent application, supplementary chemicals such as aluminium sulfate solution (alum) and poly aluminium chlorine (PACL) will be dosed in the secondary clarifier inlet to remove phosphorus as precipitates. Dosing the wastewater with these products results in the precipitation of aluminium hydroxide and aluminium phosphate, which coagulate to bind sediments and provide adsorption sites for some trace metals.

This is commonly practised to achieve similar phosphorus limits for treatment plants based in New Zealand and overseas.

Due to the chemical quantity used, chemical solutions will be delivered in bulk, and stored in a purpose-built chemical storage facility, comprising of self-bunded tank(s) and chemical dosing station(s). The chemical facility will have an unloading bund.

2.5 Current WWTP Operation and Performance

2.5.1 Current discharge volume

The following represent the current discharge volume predictions and limits for the short-term consent currently in process:

- The short-term consent (expires in December 2030) has a maximum discharge rate of 400 L/s, and a maximum daily discharge volume of 29,100 m^3/day.
- The above short term consent wastewater discharge limits have included provision of growth in the wastewater catchment, as the recent average wastewater flow is approximately 12,060 m3/day in 2024. The highest discharge volume recorded was 32,724 m3/day.

2.5.2 Projected discharge volume

The wastewater flow basis has been continued from the Short List Option Report (Appendix G), where GHD assessed the recent QLDC flow data and the latest population forecast estimate from April 2025. Table 7 summarises these flow estimates for the 2060 design horizon.

Table 7: Revised flow estimates (GHD, 2025)

	Recent WW Flows (Discharge Flow)		Wastewater Flow Estimations			
Year	2023	2024	2030	2040	2048	2060
Average Population	46,002	49,359	57,265	69,892	82,325	94,887
Peak Day Population	65,685	72,565	84,830	103,759	122,399	141,233

ADF (m^3/d)	9,995	12,060	15,061	19,080	22,475	25,904
PDWF (m^3/d)	13,388	15,934	18,675	22,897	26,970	31,085
PWWF (m^3/d)	18,861	32,724	34,640	43,885	51,692	59,579

For this consent application, the following maximum discharge volume and rates are being sought:

- Maximum daily discharge volume of 60,000 m3/day; and
- Maximum instantaneous discharge rate of 694 L/s.

2.5.3 Current discharge quality

Treated wastewater is monitored for primary wastewater contaminants (nutrients and particulate material) on a weekly basis, with samples collected after UV disinfection and prior to discharge. The implementation of the Stage 3 upgrades and removal of the oxidation pond process in September 2025 has resulted in improved treated water quality, with lower concentrations of key wastewater contaminants such as Ammoniacal-N.

Table 8 presents a summary of treated wastewater sampling data collected prior to implementation of the Stage 3 upgrades, while

Table 9 summarises treated wastewater quality following commissioning of the upgrades.

Table 8: Plant discharge sampling data (Eurofins sampling only) prior to stage 3 upgrades (Nov 2023 – October 2025)

	TSS	Nitrate (as N)	TAN	TN	TP	E.coli	cBOD5
Average	14.3	8.2	8.9	16.2	2.7	548	13.6
Median	12.0	1.6	9.6	16.8	2.4	10	13.2
90%ile	27.5	21.4	13.2	23.8	4.5	130	22.2
95%ile	38.9	28.0	17.6	27.5	4.9	1098	23.3
Count	63.0	5.0	73.0	70.0	60.0	31	67.0

Table 9: Plant discharge sampling data (Eurofins sampling only) following stage 3 upgrades (Nov 2025 – April 2026)

	TSS	Nitrate (as N)	TAN	TN	TP	E.coli	cBOD5	DRP
Average	5.9	3.6	0.2	5.4	2.8	19	2.6	2.2
Median	5.0	3.4	0.1	5.2	2.6	12	2.3	2.0
90%tile	11.5	4.7	0.4	7.2	3.7	47	3.0	3.3
95%tile	16.2	4.9	2.0	8.7	4.0	100	4.6	3.7
Count	34.0	26.0	28.0	28.0	28.0	29	28.0	21.0

Comparison of the two datasets above indicates a substantial improvement in discharge wastewater quality as a result of the recent Stage 3 upgrade, particularly in total suspended solids, total ammoniacal nitrogen and total nitrogen as shown in the figures below. The treated wastewater concentrations consistently comply with the current 2008.238.V2 consent and the proposed short-term consent limits (currently in process) except for total phosphorus and dissolved reactive phosphorus.

QLDC and the plant operators (Veolia) have made additional adjustments to the UV operation in November 2025, which encompassed linking the UV disinfection dose to both secondary clarifier outlet flowmeters, increased UV dose target for better E coli results and increased frequency of inspection and cleaning of UV intensity meter which could impact the efficacy of the UV system.

Figures 8 to 14 below show an illustration of the variations in wastewater quality over the past 12 months with the timing of the second clarifier coming online indicated.

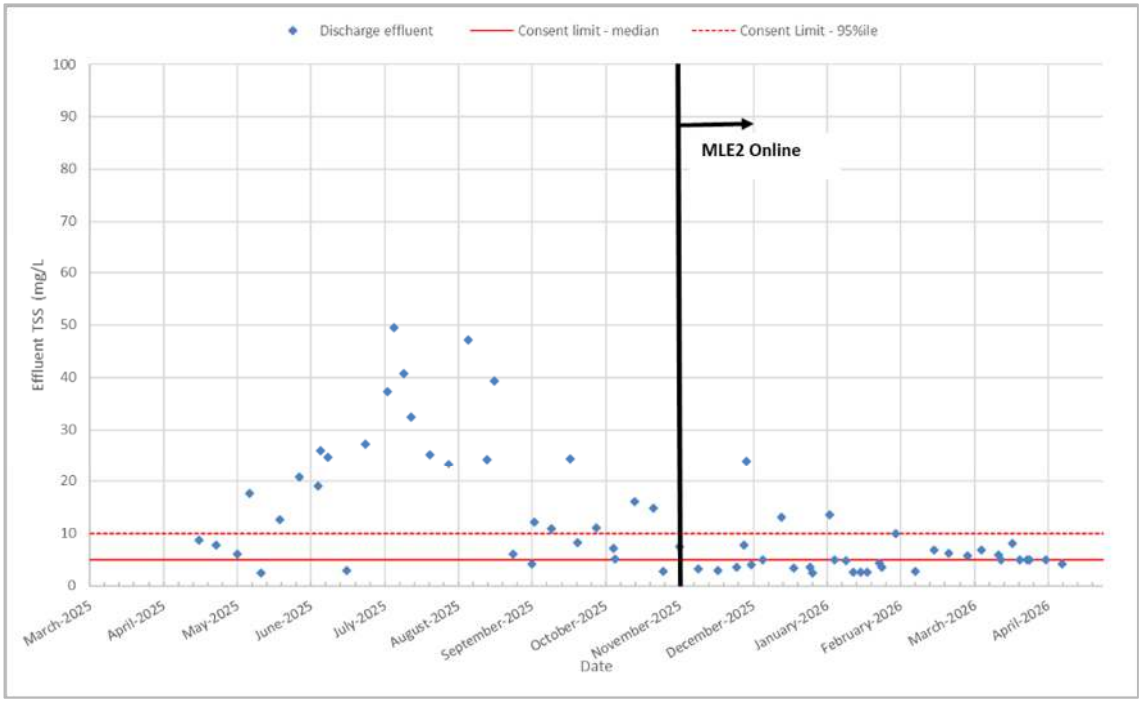

Figure 8: Discharge Effluent TSS Results – pre- and post-Stage 3 upgrade being completed

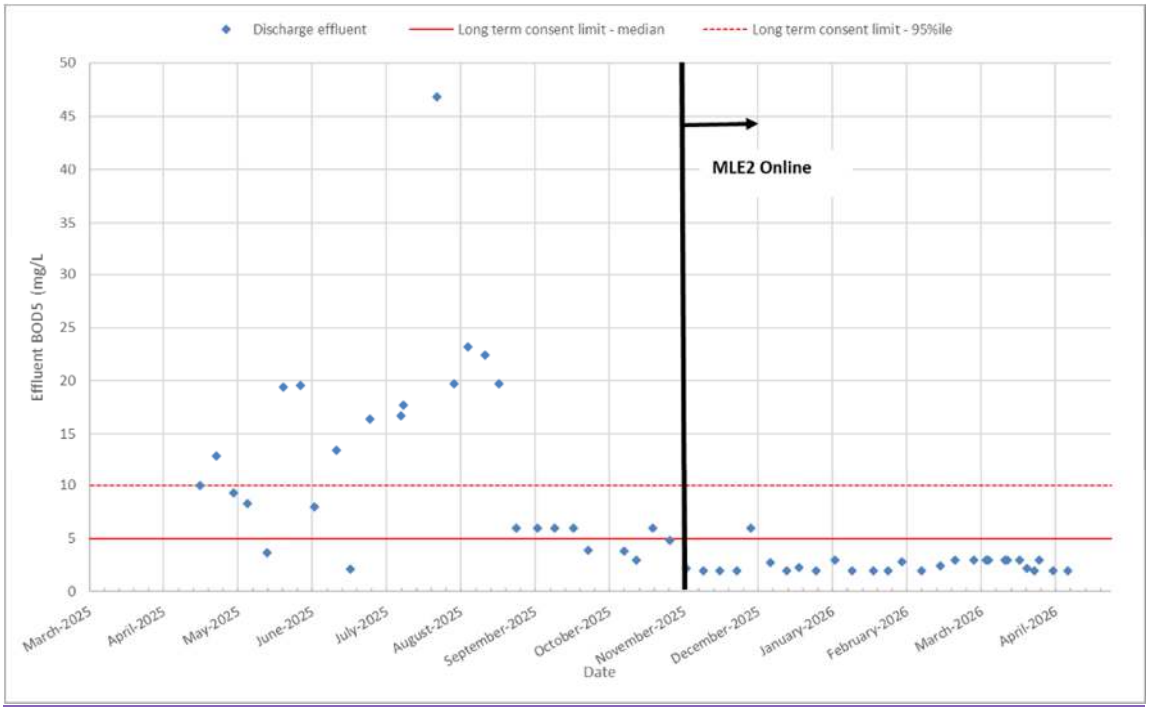

Figure 9: Discharge Effluent BOD_5 Results – pre- and post-Stage 3 upgrade being completed

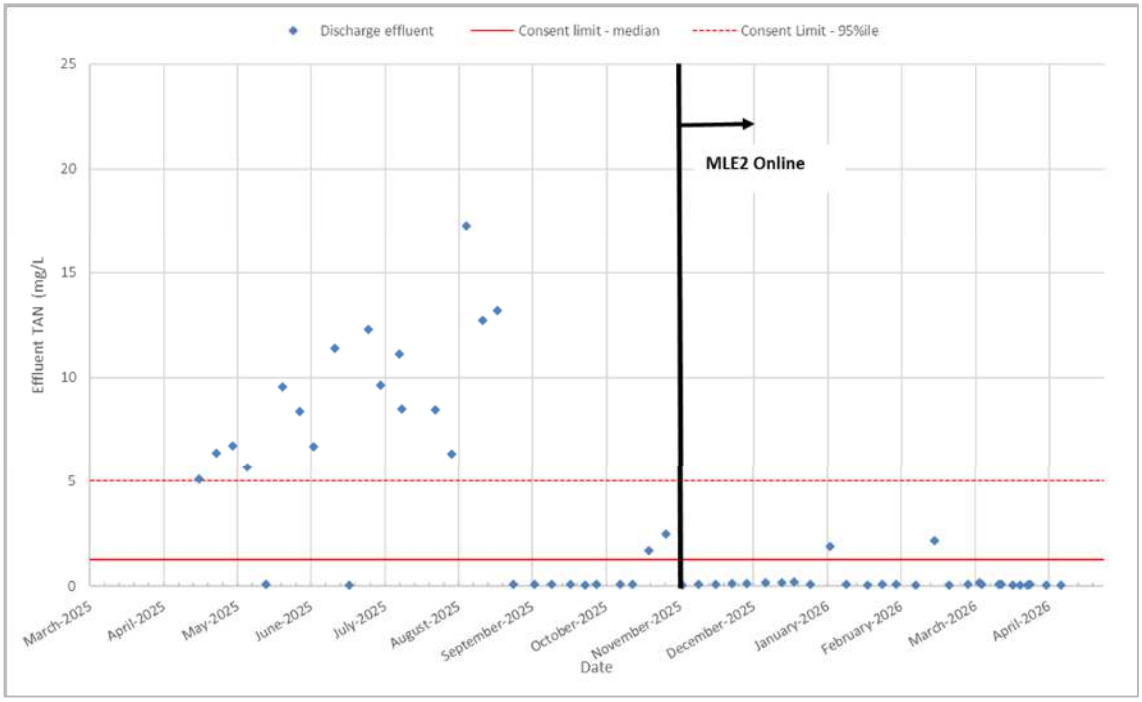

Figure 10: Discharge Effluent Total Ammoniacal Nitrogen (TAN) - pre- and post-Stage 3 upgrade being completed

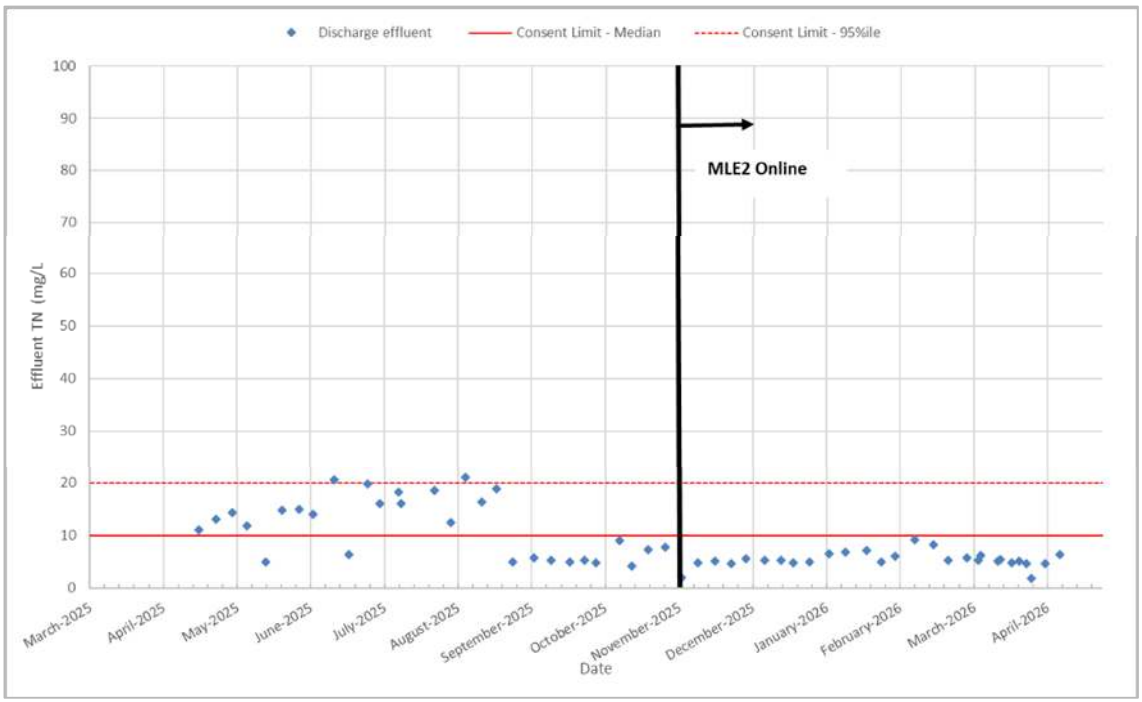

Figure 11: Discharge Effluent Total Nitrogen (TN) – pre- and post-Stage 3 upgrade being completed

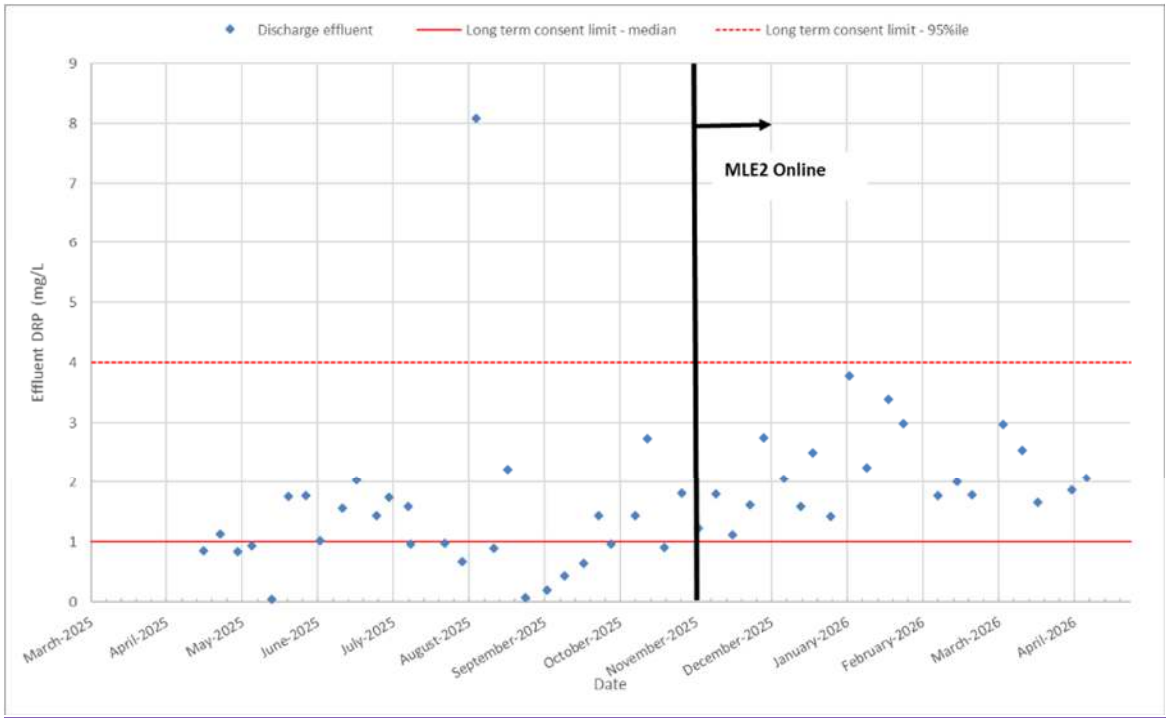

Figure 12: Discharge effluent DRP - pre- and post-Stage 3 upgrade being completed

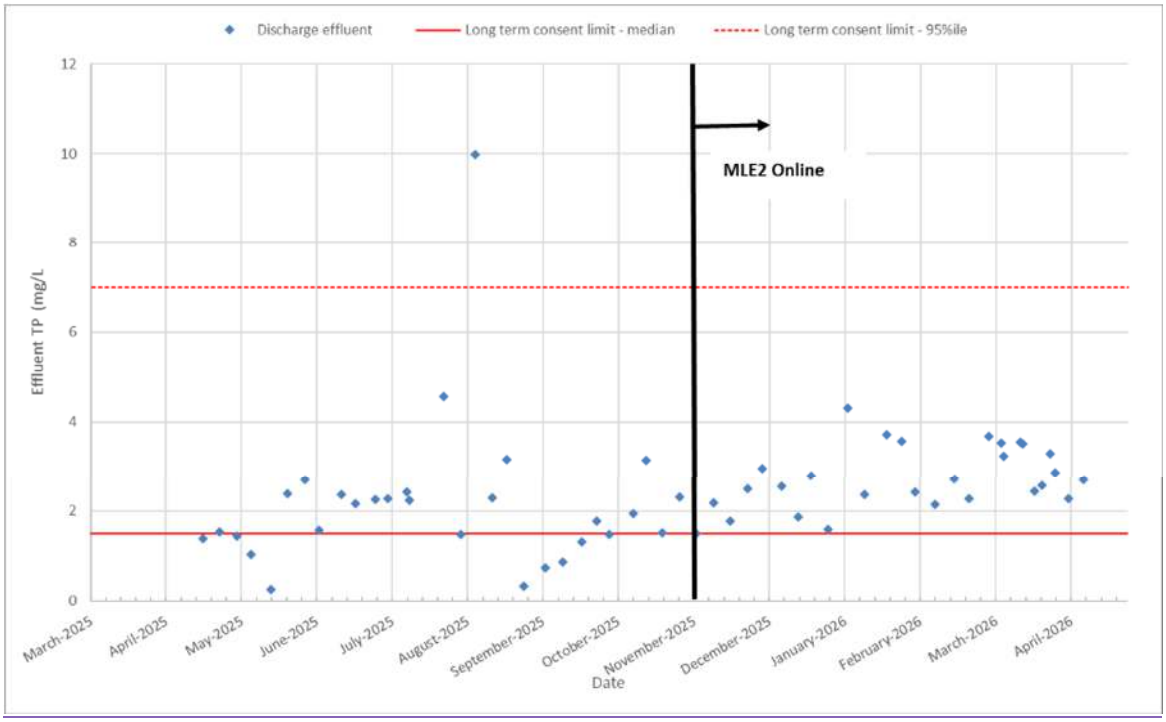

Figure 13: Discharge effluent TP - pre- and post-Stage 3 upgrade being completed

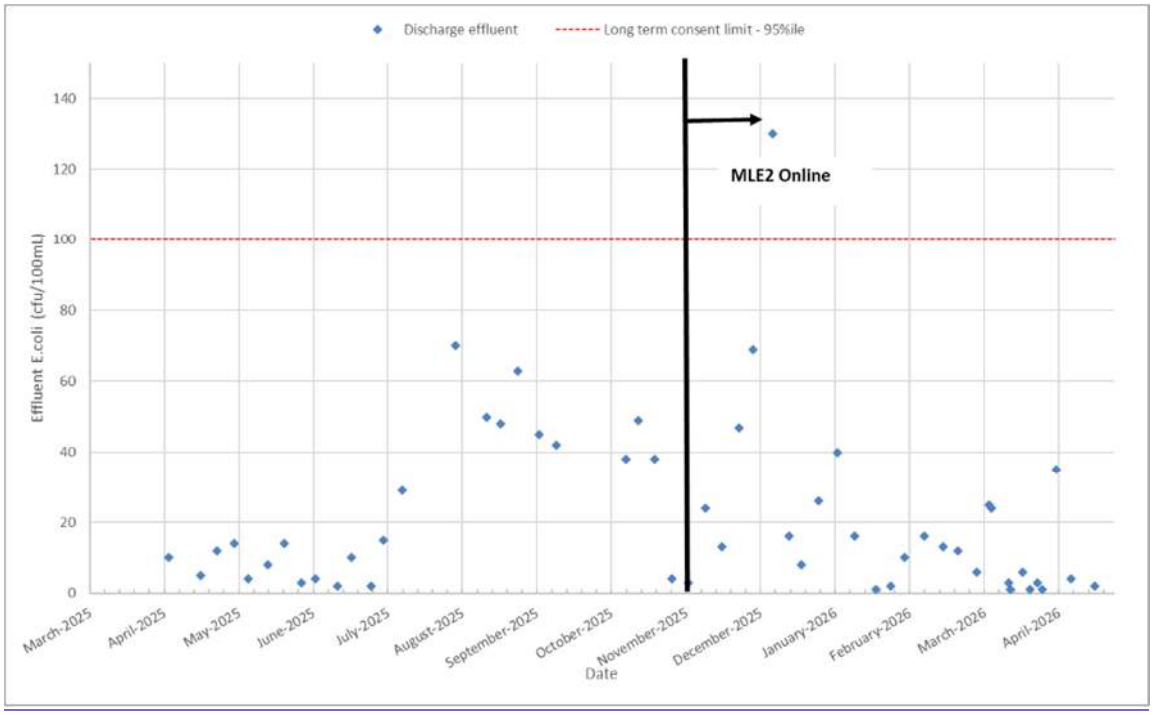

Figure 14: Discharge effluent E.Coli *- pre- and post-Stage 3 upgrade being completed*

The wastewater can contain other trace contaminants. These include microplastics from washing of clothing and other sources, endocrine disruptors from pharmaceutical and personal care products and metals in industrial and domestic wastewater. Monitoring of wastewater for trace contaminants has been undertaken periodically, these results are discussed in Section 2.3.3 and Appendix B of the GHD WQ Report in Appendix A. Samples have been analysed for metals, PFAS compounds and microplastics (an emerging contaminant). Low concentrations of PFAS and metals were measured in treated wastewater samples between October 2025 and April 2026.

2.5.4 Projected discharge quality

The table below compares the recent WWTP wastewater quality with the proposed discharge limits under this consent application. These proposed limits differ from the current limits on consent 2008.238.V2 with predominately lower median and 90/95%ile values proposed for all parameters (refer Table 10).

From the comparison of the recent treated wastewater results against the proposed discharge limits, several improvements have been identified:

- Reduction of suspended solids in the discharge effluent, which also improves the visual clarity of the discharge when it enters the receiving water. A relatively stringent TSS limit would lead to more consistent disinfection performance for complying with the E.coli limits.

- Reduction of dissolved reactive phosphorus and total phosphorus in the discharge effluent, this reduces the impact of nutrients in the receiving water.

Table 10: SWWTP Current Consent Limits, Proposed Long-Term Consent Limits and Recent SWWTP Wastewater Quality.

Parameters	Units	2008.238.V2 Limits		Proposed Consent Limits		Nov 25 to April 26 Final Wastewater Results	
		Annual mean	90th %ile	12 months Rolling Median	95%ile	Median Values	95%ile
BOD_5	g/m^3	10	20	5	10	2.3	4.6
TSS	g/m^3	10	20	5	10	5.0	16.2
TAN	g/m^3	-	-	1.25	5	0.1	2.0
TN	g/m^3	10	15	10	20	5.2	8.7
Nitrate-N	g/m^3	-	-	7	10	3.4	4.9
TP	g/m^3	8	10	1.5	7	2.6	4.0
DRP	g/m^3	-	-	1	4	2.0	3.7
E.coli	cfu/100mL	10 (geomean)	100 (95th %ile)	--	100	19 (geomean)	100

In respect of microplastics, the size of particles that could be quantified in the analysis of treated wastewater, was limited to greater than 20 µm, and so the quantum of smaller particles is not understood. The proposed improvements to the Shotover WWTP include tertiary filtration, which is expected to achieve removal of particles greater than 10 µm. The proposed upgrades are therefore expected to achieve reduction in microplastics discharges, such that the microplastics load detected in wastewater would be effectively removed.

2.5.5 Odour

As identified by GHD, potential odour discharges will be generated from the main WWTP process areas and the proposed outfall (refer to Odour Report in Appendix E).

The main WWTP process areas have the potential to generate odours associated with wastewater treatment activities. Key potential sources include the inlet works, where odours can be released from the inlet flume, rotary drum screens, screenings compactors, grit removal system and inlet works pump station. Other potential odour sources include the septage reception system, sludge storage and dewatering activities, sludge conveyors and bins, the MLE reactors, clarifiers, scum handling system, return and waste activated sludge systems, and the WAS holding tank.

The legacy pond system may also have odour potential during dewatering, residual sludge management or biological process upsets, although the ponds are no longer part of the active treatment process.

Odours from WWTP processes may include sulphurous, septic, musty, or organic wastewater type odours, depending on the source area, wastewater condition, sludge age, dissolved oxygen levels, and operating conditions at the time.

Based on GHD's experience with other wastewater treatment plants, odours from the main WWTP process areas at a plant of this size and design are most likely to be detectable within approximately 100 m to 300 m of the source areas, depending on the nature of the activity and meteorological conditions. Under adverse conditions, such as low wind speeds or stable atmospheric conditions, odours may occasionally be detectable further downwind. However, odour intensity would be expected to reduce with distance as emissions disperse and dilute in the surrounding environment.

In contrast, the proposed outfall will discharge treated wastewater following primary, secondary, and tertiary treatment. Based on GHD's experience with other wastewater treatment plants, treated wastewater discharged at an outfall has potential to generate odour. Such odours typically exhibit a musty, earthy, or algae like character. However, the intensity of these odours is expected to be no more than distinct, and they are more commonly described as very weak or not detectable. Odours associated with the outfall are likely to be detectable only within approximately 50 m of the discharge point, and wouldn't typically be expected under day-to-day operation of the treatment plant.

Figure 15: Odour receptors near the Shotover WWTP and proposed outfall

2.6 Discharge Mechanism

Treated wastewater will be conveyed from the UV system to the Kawarau River via a buried pipeline, and discharged into the river via an outfall. The preliminary design currently proposes a rock outfall structure at the terminus of the conveyance pipeline, however there is a possibility for future adoption of an alternative outfall design that utilises direct discharge of treated wastewater to the wetted river bed via a pipe only.

The below sections explore both of these design approaches, to the extent that the provided information on these designs permits.

2.6.1 Wastewater discharge pipeline

The wastewater discharge pipeline (identified as "effluent discharge line" on the drawing set) conveys treated wastewater from the WWTP to the outfall at the Kawarau River for discharge. Estimated pipe length is 1.3 km, with the alignment running generally parallel to the western and southern batters of ORC's training line and will be buried along its length (Figure 16).

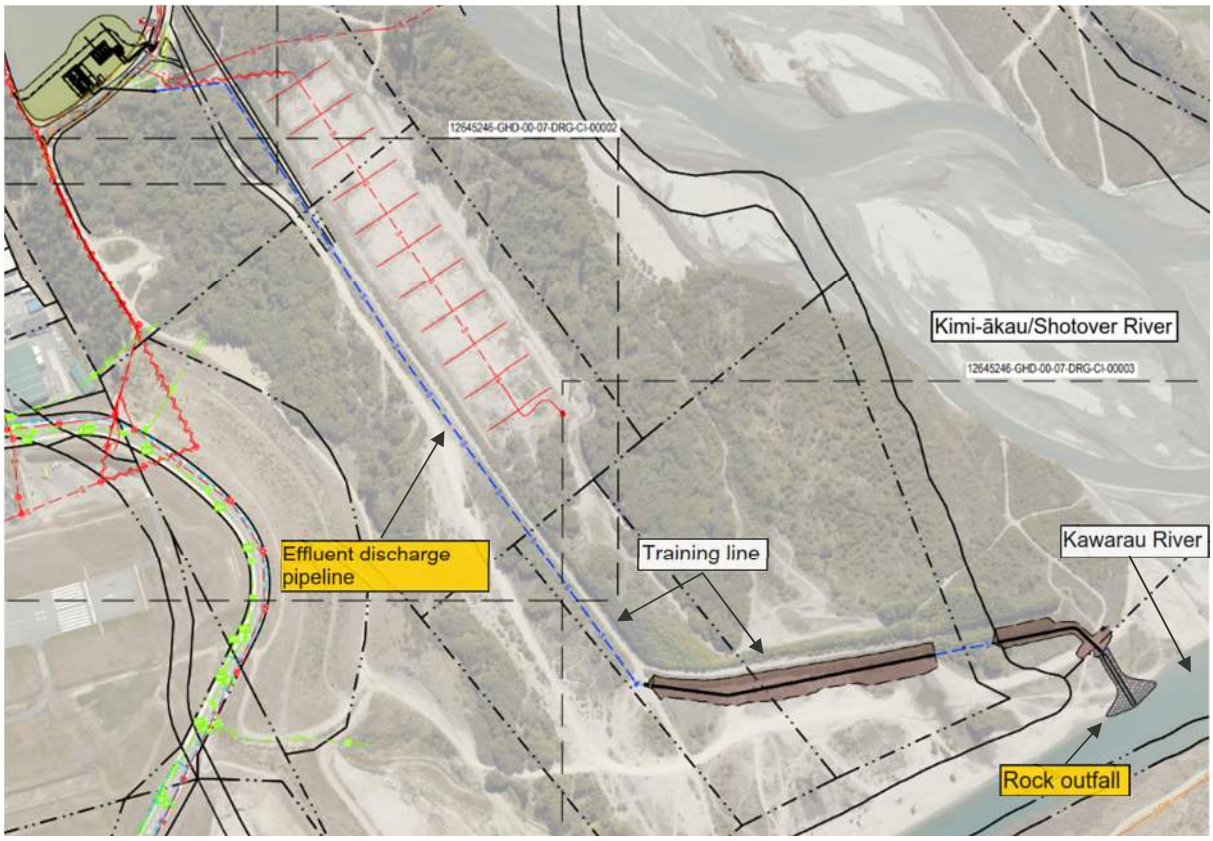

Figure 16: Proposed wastewater discharge pipeline and outfall overview (adapted from GHD's Drawing No. CI-00001)

Civil drawings CI-00005 to 00008 (Appendix K) detail the pipe alignment, the anticipated pipe buried depth and location of manholes along the pipe route. For most of its length, the pipe will be buried below existing ground level (likely via trenching and subsequent backfilling, however the final installation methodology will be determined by the appointed contractor), with some of the end sections of the pipe buried via imported engineered fill to provide sufficient cover. The pipe terminates into a manhole immediately upstream from the outfall.

The civil design for the wastewater discharge pipeline includes:

- A buried DN1000 GRP pipeline installed within a trench (or maybe trenchless as noted above), designed to suit the Shotover Delta ground conditions;
- Provision of a minimum of 0.7 m cover (TBC in detailed design) to protect the pipeline while generally maintaining existing surface levels;
- Sufficient setback from the existing training line embankment toe to minimise interference with the existing flood protection structure;
- Specific provisions such as concrete cover would be provided at locations where heavy vehicle crossing the pipeline are expected, to reduce the risk of pipe damage;
- Localised fill placement over the pipeline alignment where required to achieve minimum cover and surface continuity; and
- Manholes and access structures at defined locations to enable inspection, operation, and maintenance.

Where minor changes in alignment occur and a manhole is not required, fabricated GRP bends will be used, with inspection shafts provided as appropriate to maintain access for operation and maintenance.

Most of the discharge conveyance pipe will be located on QLDC-owned or administered land (including the paper road shown on the plan in Figure 17 below), with only the final section of the pipe and all of the outfall to be located on Crown land.

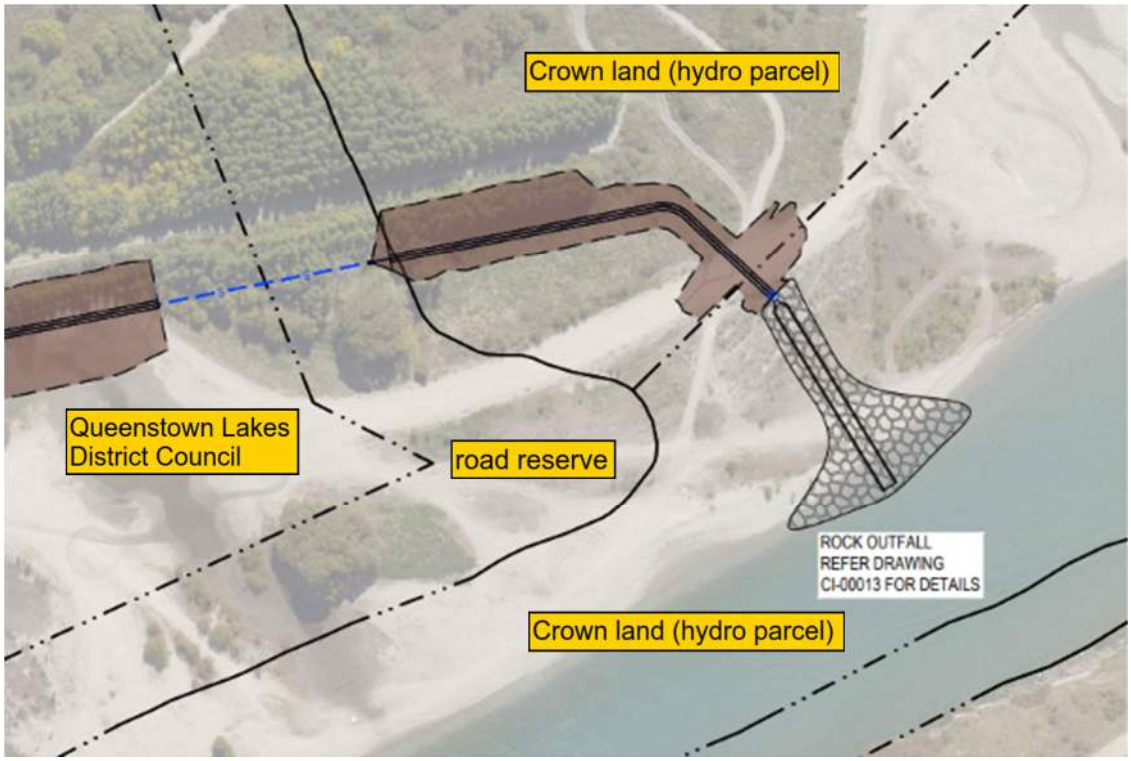

Figure 17: Land ownership in relation to proposed discharge pipe and outfall (source: GHD and GRIP)

2.6.2 Rock outfall

The preliminary design is for treated wastewater conveyed via the pipeline to be discharged to the Kawarau River via a rock outfall.

A conceptual design of the rock outfall has been developed to meet the following objectives:

- Dispersion of treated wastewater into the Kawarau River;
- A passive structure that blends in with the surrounding environment; and
- Minimised exposure of the public to treated wastewater prior to adequate mixing in the river.

A recent river bathymetry survey during low-flow conditions (Earth Sciences New Zealand, March 2026) has indicated that optimum dispersion into the river is achieved with an outfall that extends approximately 10 metres into the wetted river bed. Below is an indicative general arrangement for the rock outfall, which utilises landscaping to visually screen the outfall structure and discourage public interaction with the structure.

Figure 18: Indicative concept design for rock outfall (source: Boffa Miskell)

The conveyance pipeline terminates at a new manhole located near an existing river access track, which connects to the rock outfall structure. The indicative concept plan shows treated wastewater will be conveyed to the river via multiple corrugated HDPE pipes within an extended rock structure (Figure 19 and Figure 20). The rock outfall structure would require an anchoring system , the details of which will be further developed during detailed design.

Large rocks, layering of rocks, and the geometry of the rock channel have been indicated to provide resilience during high-flow and flood events, while remaining compatible with the dynamic river delta environment, and to limit public exposure to treated wastewater prior to adequate mixing in the river. The outfall is designed as a passive structure with no moving parts, reducing operational complexity and maintenance requirements.

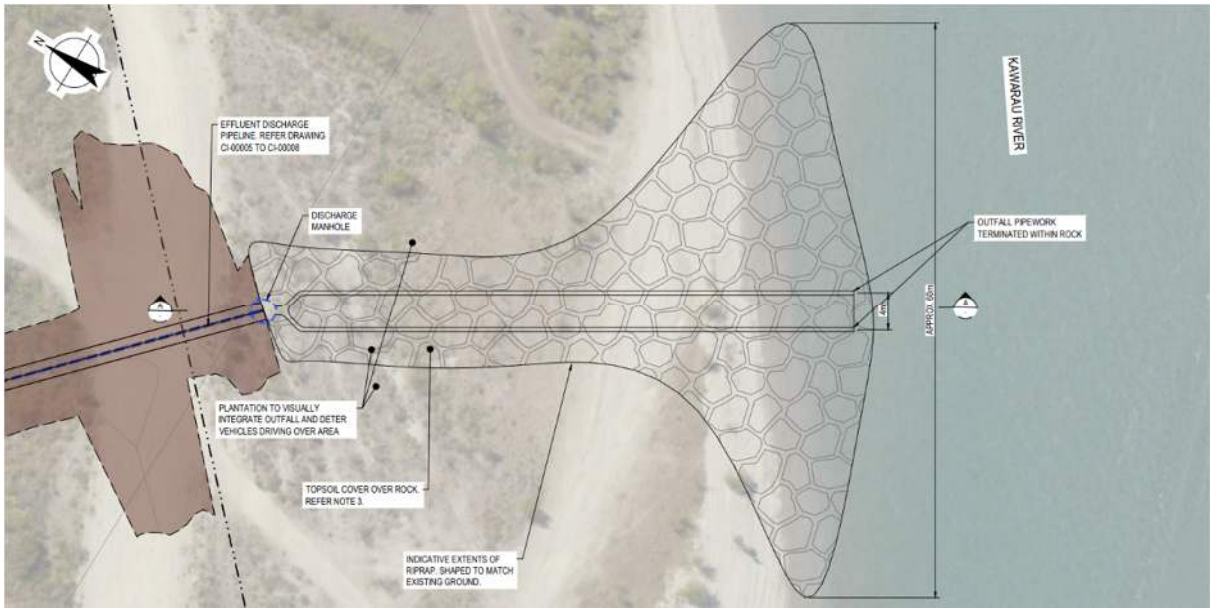

Figure 19: Indicative concept design for rock outfall, noting that this is subject to further detailed design (taken from GHD drawing CL-00013)

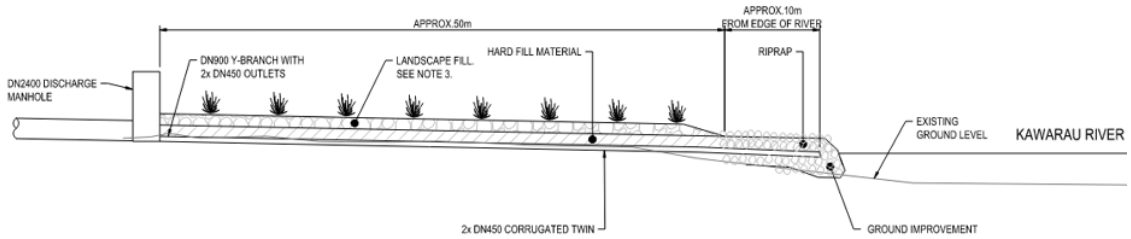

Figure 20: Indicative concept design rock outfall structure indicative section (source: GHD drawing CL-00013)

The anchoring system may consist of concrete blocks covered with riprap and embedded into the ground to sufficient depth with straps around the pipes. This will be confirmed once further design and field investigations are completed. The outlet pipes will be protected from high-velocity flows and debris via placement of larger rocks.

Planned monitoring and routine maintenance activities for the proposed system are required. Key maintenance activities to the rock outfall system include potential rehabilitation of riprap or protective rocks following flood events, vegetation maintenance, and removing any debris accumulated at the outfall termini.

2.6.3 Alternative outfall pipe

Preliminary design discussions have highlighted the potential for an alternative outfall design to be investigated and developed. While the details of this design are yet to be determined, the outfall may instead consist of an extension of the discharge pipeline into or onto the wetted bed of the Kawarau River, to a point where flows in the river would promote optimum treated wastewater mixing. It is not yet known whether the outfall pipe would be buried for any of it's length within the wetted bed, nor what diffuser infrastructure would be utilised, if any.

2.6.4 Discharge infrastructure earthworks

The below figure summarises anticipated earthworks required adjacent to and within the riverbed. As can be seen, all of the pipe alignment within Crown land requires placement of engineered fill in order to bury the pipe to a suitable depth. This will require careful infilling around trees planted by ORC to stabilise the toe of the training line embankment, under the guidance of an arborist to minimise damage to the trees.

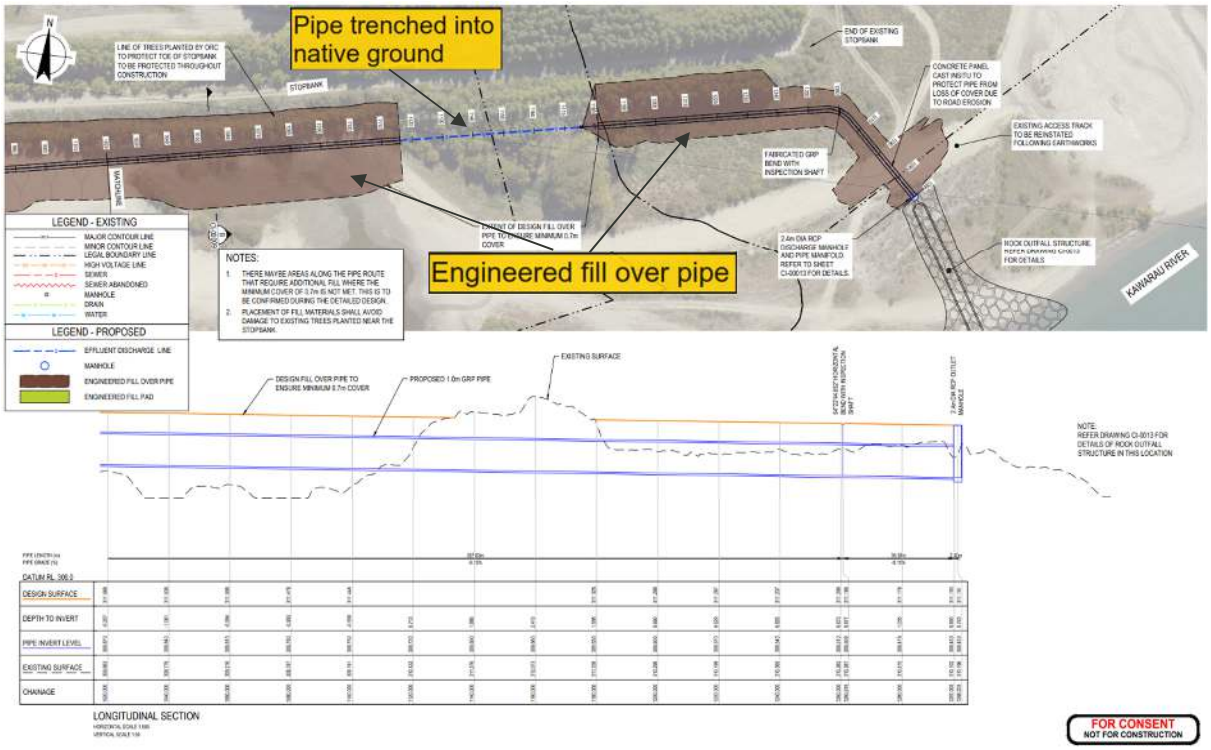

Figure 21: Discharge pipe installation earthworks on Crown land (adapted from GHD drawing)

Localised earthworks will also be required for construction of the two outfall options, including (but possibly not limited to) trenching required to install the large diameter HDPE pipes adjacent to the wetted riverbed, and excavations required to install the anchoring system and protective rock, outfall pipes and/or diffuser on or in the wetted bed.

The below table provides preliminary estimates of earthworks areas and volumes associated with proposed discharge infrastructure works on Crown land.

Table 11: Earthworks volumes and areas for discharge infrastructure works on Crown land (source: GHD)

DN1000 pipeline		
Cut	821	m^3
Fill	1,485	m^3
Balance	664	m^3
Area disturbed	2,262	m^2
Outfall		
Cut	1,330	m^3
Fill	1,330	m^3
Balance	0	m^3
Area disturbed	2,660	m^2

2.6.5 Earthworks methodology and erosion and sediment controls

The following provides an indicative earthworks methodology, including associated erosion and sediment controls where applicable, for the proposed conveyance pipeline and rock outfall construction. Note these methodologies and control measures are preliminary, and subject to change via detailed design.

- Stage 1 (NW-SE pipe installation – no overfill required)
    - Install construction site fencing and traffic management;
    - Locate and take measures to protect ORC rock stockpile to west of proposed pipeline corridor, at approx. NZTM2000 1334800E 5015900N. This may include fencing off the stockpile with bunting or similar, or shifting any rocks from the stockpile carefully outside the works area;
    - Large vegetation removal;
    - Topsoil strip and stockpile (topsoil to be stockpiled separately to vegetation, where applicable);
    - Excavate trench, stockpile cut material as windrow on downhill side of trench;
    - Place pipe bedding material;
    - Install pipe and manholes;
    - Backfill with pipe bedding material as specified;
    - Backfill trench with stockpiled material. Spread with topsoil and seed/hydroseed to stabilise surface. Use water carts or sprinklers (e.g. K-Lines) to keep seed and soil moist, and encourage germination (depending on time of year);
    - Remove fencing once grass has established.
- Stage 2 (section of pipe ~parallel to river – design fill over pipe generally required)
    - Install construction site fencing;
    - Subsoil excavations to commence during low-flow river conditions, with clear long-range forecast where possible. This is to avoid encountering fluvially-connected groundwater during excavations;
    - Install silt fence running parallel to earthworks/pipe. Silt fence returns installed at regular intervals to reduce flowpath lengths;
    - Establish tree protection for ORC-planted trees at base of training line, under the guidance a suitably qualified arborist;

- Remove large vegetation and topsoil strip and stockpile (topsoil to be stockpiled separately to vegetation, where applicable). Stockpile upslope of silt fence;
- Excavate trench, stockpile cut material separately upslope of silt fence;
- Where groundwater is encountered during excavations, dewater in line with Auckland Council's *Erosion and sediment control guide for land disturbing activities in the Auckland region* (GD05) recommendations (pgs 144-146). This may entail discharging via submersible pump to a dewatering bag (if low flows) or turkey nest or decanting earth bund if relatively high flows. Avoid direct discharges of sediment-laden water to surface water, or to land where it may enter surface water.
- Place pipe bedding material as specified;
- Install pipe and manholes;
- Backfill with pipe bedding material as specified;
- Backfill trench with stockpiled subsoil;
- Place additional fill as required to build up to design surface where natural ground level is too low (refer brown shaded areas on drawings CL-00007 to 00008);
- Re-spread topsoil and seed/hydroseed to stabilise surface. Option to mulch and re-spread cleared vegetation as interim soil stabilisation. Use water carts or sprinklers (e.g. K-Lines) to keep seed and soil moist, and encourage germination (depending on time of year);
- Once grass is established, silt fence and any other ESCs can be removed.

- Stage 3 (outfall works)
  - Remove local silt fence if still installed;
  - In-river navigation hazard measures installed in line with Harbourmaster guidance;
  - Install silt curtain with a floating boom;
  - Install temporary construction site fencing;
  - Vegetation strip and stockpile;
  - Topsoil strip and separate stockpile;
  - Excavate rock outfall footprint within wetted bed;
  - Excavate rock outfall footprint outside of wetted bed;
  - Install outfall infrastructure as per design;

- Remove silt curtain once area is fully stabilised/outfall infrastructure is installed. Any disturbed surfaces adjacent to the outfall will need to be topsoiled and seeded with 80%+ vegetation coverage or otherwise stabilised prior to removing ESCs;
- Planting and landscaping works.

Where any of the above stages require works over an existing cycle/walking path or vehicle access, alternative detour routes will be provided around the works site.

2.7 Risk Mitigation

Over the past year, and with the commissioning of the Stage 3 MLE upgrades, QLDC alongside their WWTP operator Veolia, has reviewed the WWTP operation and maintenance programme to identify opportunities to improve reliability of performance. This has flowed through into updates to the Operations and Maintenance Manual (OMM) and the initial preparation of a Contingency and Incident Response Plan (CIRP), a draft of which will soon be provided to ORC as a requirement under the short-term consent in process, and to support the processing of this application.

The purpose of the CIRP is to identify potential causes of treatment plant and disposal system failures, including identification of desired operating parameters/range, response procedures and root cause analysis of any discharge quality or quantity exceedances.

A more detailed Hazard and Operability Study (HAZOP) will be completed in early 2027 as the last step in finalising the CIRP. A HAZOP is a structured, systematic risk assessment process used to identify potential hazards and operability issues in complex process systems such as a WWTP. It involves a multidisciplinary team (typically operations, engineering, process design, and safety specialists) reviewing the plant in a series of defined "nodes" (e.g. treatment stages or unit processes) and applying guidewords (such as "more", "less", "no", or "reverse") to key process parameters (e.g. flow, pressure, concentration). This method prompts the team to consider how deviations from intended operation could occur, what their causes and consequences might be, and whether existing safeguards are adequate.

In the context of the Shotover WWTP, a HAZOP will help ensure robust and reliable operation by systematically identifying risks such as overflows, treatment failures (e.g. nitrification upset), chemical dosing errors, or equipment malfunctions that could affect compliance and environmental outcomes. The process will lead to targeted recommendations—such as design modifications, improved monitoring, or operational controls—which reduce the likelihood of incidents, improve resilience, and demonstrate how foreseeable risks have been appropriately managed, in respect of potential adverse environmental effects and ongoing condition compliance.

A summary of current and proposed key risk mitigation measures is included in Table 12.

Table 12: Risk Mitigation Measures

Mitigation Measures	Description	Timeline
Internal Testing	Plant operators conduct regular testing (>2x per week) at various treatment stages to monitor plant performance on top of compliance testing using photospectrometer or other devices on site. This enables the operators to make the required process adjustments.	Ongoing
Weekly Testing of UV Treated wastewater	Plant operators collect UV treated wastewater samples on a weekly basis and tested by an accredited laboratory on top of consent compliance testing (monthly frequency). Similar to "internal testing", this enables the operators to make the required process adjustments.	Ongoing
Process upgrades	The addition of a tertiary filter will remove fine solids and associated contaminants resulting in more effective and consistent UV disinfection. Enhanced UV treatment will improve pathogen inactivation, with potential for additional log removal to ensure very high levels of disinfection prior to discharge. Both of these upgrades will reduce the risk of poor quality wastewater being discharged resulting in significantly reduced risks to public health for users of the receiving environment.	To be in place by December 2028 (likely prior to the discharge to the Kawarau River commencing)
O&M Manual update	Plant operators will be working with an updated O&M manual with identification of critical equipment, installed redundancy and options of contingency measures. This improves the plant operation reliability and consistency.	Most recent update in June 2025, further update by November 2026
CIRP draft	QLDC will develop a draft CIRP that will be further finalised through the completion of a full HAZOP study as described further above.	Draft by November 2025, finalised post HAZOP by June 2027.
Turbidity online reading at Clarifier Outlet	This provides a continuous measurement of clarifier effluent quality.	Ongoing

Mitigation Measures	Description	Timeline
	A turbidity sensor will be installed at the tertiary filter outlet, for monitoring the quality of treated water going through UV disinfection.	To be in place by December 2028 as part of tertiary filter upgrade.
UV Dose monitoring	UV dose is a robust measure of UV disinfection effectiveness as bacteria inactivation is directly related to the UV dose. This has been introduced in the short-term consent as a consent condition and will continue through the long-term.	Ongoing
Online analysers at the plant discharge	Online water quality analysers can provide near real-time information (e.g. every 15 to 30 minutes, depending on equipment) for important contaminants such as ammonia, dissolved reactive phosphorus and nitrate.	To be in place by December 2028 as part of enhanced UV upgrade.
Raw water calamity pond (RWCP)	A new raw water calamity pond is located at the front end of the treatment process and is used as an emergency storage and containment measure for untreated influent. If critical plant components fail (e.g. power outage, major mechanical failure, or hydraulic overload), incoming sewage can be temporarily diverted and stored rather than bypassing untreated to the environment. Its primary purpose is therefore environmental protection and network resilience, preventing raw sewage discharges during catastrophic or upset conditions.	In place
Treated wastewater calamity pond (TWCP)	A proposed treated wastewater calamity pond sits at the back end of the treatment process and manages risks associated with poor-quality treated wastewater. It is to be formed from the decommissioned oxidation Pond 3 and is intended to remain dry under normal operation. When the treatment process is not performing as expected (e.g. treatment upset, non-compliant wastewater), treated wastewater will be diverted into this pond instead of being discharged. The stored wastewater can then be returned to the inlet works or reprocessed through downstream treatment (e.g. UV) once conditions improve. Its function is therefore to provide compliance assurance and operational	To be operational by December 2027.

Mitigation Measures	Description	Timeline
	buffering, ensuring that substandard wastewater is not discharged to the Kawarau River.	
Location/design of outfall	Preliminary design of the outfall identifies a key design parameter of ensuring the discharge is into higher velocity flow to enable optimal dilution, thereby avoiding/minimising adverse water quality and ecological effects.	As part of outfall detailed design and construction.
Stormwater inflow and infiltration	QLDC will continue is programme of investigating and remediating stormwater inflow and infiltration into the wastewater network to ensure that overall influent loads to the WWTP remain within its design parameters for optimal function.	Ongoing
Receiving Environment Monitoring	Proposed condition (22) outlines the receiving environment water quality monitoring in relation to the discharge of treated wastewater to the Kawarau River via the outfall. Undertaking frequent, robust monitoring enables a feedback loop as a key tool in triggering further mitigation and proceed improvements as required. Also refer to Section 2.9.	In draft as of May 2026 (see section 2.8 below)

2.8 Proposed Consent Limits

The maximum discharge volume and rate sought for this consent (as set out in section 2.5.2 above) are:

- Maximum daily discharge volume of 60,000 m3/day.
- Maximum instantaneous discharge rate of 694 L/s.

The discharge quality parameters will follow those in Table 10.

2.9 Proposed Sampling and Monitoring Regime

The proposed sampling and monitoring regime is included in proposed condition (22). It includes monitoring of the following:

Table 13: Proposed Sampling and Monitoring Regime

Sampling Locations	Parameters	Minimum Frequency
Plant Flows	Locations: Plant Inlet, Clarifier Outlets Type: Electro magnetic flowmeters Flow monitoring: Daily totals and instantaneous rates	**Continuous measurements**
Discharge Flow Rate	Combined Clarifier Outlet flowmeter (now to December 2028, then change to enhanced UV flowmeters)	**Continuous measurements**
WWTP Influent (for operational monitoring)	24 hour time composite samples Parameters: COD, cBOD5, TSS, Tot N, TAN, TP, Alkalinity and pH.	**Weekly**
Clarifier Effluent (for operational monitoring)	Grab Sample Parameters: cBOD5, TSS, Tot N, TAN, NO3N, TP, DRP, and pH.	**Weekly**
UV Effluent (Consent Compliance Location)	24 hour time composite samples, except for E Coli (grab samples) Parameters: COD, cBOD5, TSS, Tot N, TAN, NO3N, NO2N, TP, DRP, Dissolved Aluminium, E Coli	**Weekly**
Receiving Environment	Field measurements: Temp, pH, EC, ORP, DO, Clarity Laboratory parameters: cBOD5, Tot N, TAN, NO3N, TP, DRP, Dissolved Aluminium, and E.Coli. Grab samples for surface water quality monitoring upstream and downstream on Kimi-ākau/Shotover River and Kawarau River (monthly). Macroinvertebrate and periphyton monitoring upstream and downstream on Kimi-ākau/Shotover River and Kawarau River (up to twice a year depending on stable flow conditions occurring).	**Various**

Sampling Locations	Parameters	Minimum Frequency
	Locations of proposed monitoring are shown in Figure 22 below, noting that location RS17 is subject to landowner permission for access. More details of proposed monitoring methods for instream ecology are provided in proposed condition (22).	

Figure 22: Proposed surface water and ecology monitoring locations

2.10 Duration Sought

A duration of 35 years is proposed.

Statutory Framework for Consent Duration

Section 123 of the Resource Management Act 1991 (RMA) enables discharge permits to be granted for up to 35 years. The Act provides discretion to determine an appropriate duration based on the activity's characteristics, scale of effects, and associated risks or uncertainties. A 35-year term sits at the upper end of this range and is commonly applied to large-scale infrastructure requiring long-term certainty.

Nature of the Activity – Essential Infrastructure

The discharge is from a municipal WWTP, which is critical public infrastructure supporting public health, environmental protection, and urban development. As a lifeline utility servicing Queenstown, the WWTP must operate continuously and cannot be readily relocated or discontinued. Its essential and long-term nature strongly supports a long-term consent duration.

Alignment with Asset Lifecycle and Investment

Wastewater infrastructure involves significant capital investment and long asset lifecycles, typically exceeding 30 years. Substantial expenditure has already occurred and further investment is required for upgrades, including tertiary filtration and enhanced UV disinfection. A shorter consent would create inefficiencies by misaligning regulatory approvals with asset life and increasing costs for ratepayers. A 35-year term provides certainty and supports efficient investment.

Efficiency and Avoidance of Re-consenting

Shorter consent durations would necessitate repeated consenting processes, duplicating technical assessments, consultation, and costs when effects can be well understood now for a longer period.

Predictable and Manageable Effects

The discharge is from an existing WWTP with a well-understood operational history. Monitoring and modelling confirm that effects are predictable and can be appropriately managed through consent conditions, including limits and mitigation measures. This level of certainty supports a longer consent duration.

Adaptive Management and Review

A 35-year consent does not remove regulatory oversight. Section 128 review conditions, along with monitoring and reporting requirements and proposed risk mitigation measures, enable conditions to be revisited if circumstances change. Periodic reviews (e.g. every 10 years) provide flexibility to address emerging issues or improvements in treatment technology.

Consistency with Planning Framework and Practice

Under the RPW, discharges are discretionary and assessed case by case. Long-duration consents are commonly granted for municipal wastewater infrastructure where effects are managed. A 35-year term is therefore consistent with both the planning framework and established practice.

Addressing Concerns

Potential concerns, such as environmental sensitivity or future technological advances, can be addressed through conditions, monitoring, and review mechanisms. The conditions propose a 10-yearly Wastewater Management Review Report which will enable consideration of emerging technologies.

Conclusion

Overall, a 35-year consent duration is appropriate given the essential and long-term nature of the infrastructure, the scale of investment, and the need to avoid inefficient re-consenting. Effects are well understood and can be effectively managed through conditions and ongoing review. This represents a balanced and efficient outcome under the RMA.

2.11 Compliance History

A summary of ORC enforcement data for the period 2019–2025 was obtained and records a total of 37 enforcement actions taken against QLDC, of which the majority (27) have been closed, with a smaller number (10) remaining in progress. The actions comprise predominantly infringement notices (23), along with a smaller number of abatement notices (13), and a single enforcement order.

The enforcement actions are primarily associated with wastewater and stormwater management matters, with a clear concentration of issues relating to the Shotover WWTP (15 records), along with recurring stormwater-related matters at Bullock Creek and Hikuwai, and additional wastewater-related actions at the Wānaka, Hāwea and Glendhu Bay Campground treatment plants. The enforcement matters currently in progress are almost exclusively abatement notices, with one enforcement order, and are distributed across a number of sites including Shotover, Wānaka, Hāwea and stormwater locations. Overall, the compliance records indicate that while a number of compliance issues have arisen across the network, these have predominantly resulted in lower-level enforcement responses and are being actively addressed, with most matters now resolved.

The EO remains in place in respect of the Shotover WWTP and this application for a long-term solution forms one of the required steps under that order which was for this application to be made by 31 May 2026.

3. Description of the Environment

3.1 Location and Site Description

The Shotover WWTP is located on the Shotover delta, to the south of the State Highway 6 bridge over the Kimi-ākau/Shotover River. The legal description of land at the discharge channel outlet is Section 4 SO 409393: Crown Land designated for conservation purposes under Section 62(1) of the Conservation Act 1987 (refer Figure 23 below for map showing land ownership).

The WWTP is located on the true right bank of the Kimi-ākau/Shotover River, below and to the east of the Frankton flats. The topography is generally flat, with most of the area surrounding the discharge channel vegetated with predominantly exotic species, including willow, poplar and sumac. Terrestrial vegetation in the within the project works area largely consists of introduced species and is dominated by willow, buddleia, tree lupin, and broom with negligible to low ecological values (refer EcIA report – Appendix B while much of the open riverbed n is largely free of vegetation and comprised of fluvial gravels. Photos of the project site are contained in the graphic supplement of the LNCA report in Appendix D.

The area of proposed treated wastewater discharge to the Kawarau River is from the Shotover delta, on the true left riverbank of the Kawarau, immediately upstream of the current day confluence of the Kimi-ākau/Shotover and Kawarau Rivers. The two rivers have very different characteristics. The Kawarau River is fed from Lake Wakatipu and flows east as a large high energy river that is generally constrained to a single channel, and is typically clear and gravel-bed dominated. The Kimi-ākau/Shotover River is a steep, braided alpine river draining an erodible schist catchment.

At the confluence, the Shotover forms a gravel delta that extends into the Kawarau channel. The Shotover delta has currently active flows and channels on its true left bank which is approximately 650 m in width. A further 700 m (width) of the delta on the true right bank is covered with established vegetation and flow in this area is constrained by flood infrastructure. The Kimi-ākau/Shotover River training line runs from the oxidation ponds to the north down towards the Kawarau River before heading east towards the confluence with the Kimi-ākau/Shotover River. The training line has, in effect, turned the discharge location from being within the Shotover delta to being the bank of the Kawarau River.

The works sit within a landscape influenced by river training works, stopbanks, existing wastewater infrastructure, gravel extraction activity and informal recreation.

Ongoing movement of the Kimi-ākau/Shotover river channels occurs, particularly with flood events, as large volumes of coarse sediment and fine suspended material are delivered in the lower delta. These inputs also locally alter channel form, flow patterns, and water clarity in the Kawarau at and downstream of the confluence. Downstream of

the confluence with the Kimi-ākau/Shotover River, the Kawarau River receives flow from the Arrow River, Roaring Meg and Nevis River (along with other smaller tributaries), before flowing through the Kawarau Gorge, and ultimately joining with Lake Dunstan upstream of Cromwell.

The area where the Shotover WWTP is located is described by ORC in its Regional Water Plan as the Lakes subregion. This subregion contains a large area of high country and is dominated by the glacial lakes Hawea, Wanaka and Wakatipu. Rainfall in this region can vary from 600 mm in the Kawarau Gorge to over 8,000 mm in parts of the Southern Alps which feed the Clutha catchment. The landscape changes significantly as the Clutha River flows towards the coast, with the Southern Alps and glacial lakes giving way to broad tussock covered inland basins and coastal hills. Land use in the lower catchment has the potential to impact on water quality with activities including hydro-electric dams, urban development (small towns including Cromwell, Alexandra, Roxburgh and Balclutha) and intensive pastoral and horticulture development.

Figure 23: Land ownership/administration within the Shotover delta. Unmarked riverbed is crown-owned riverbed managed by LINZ

3.2 Climate

The average annual rainfall from 1990 – 2020 is shown in Figure 24. There appears to be relatively high variation in total annual rainfall between each year.

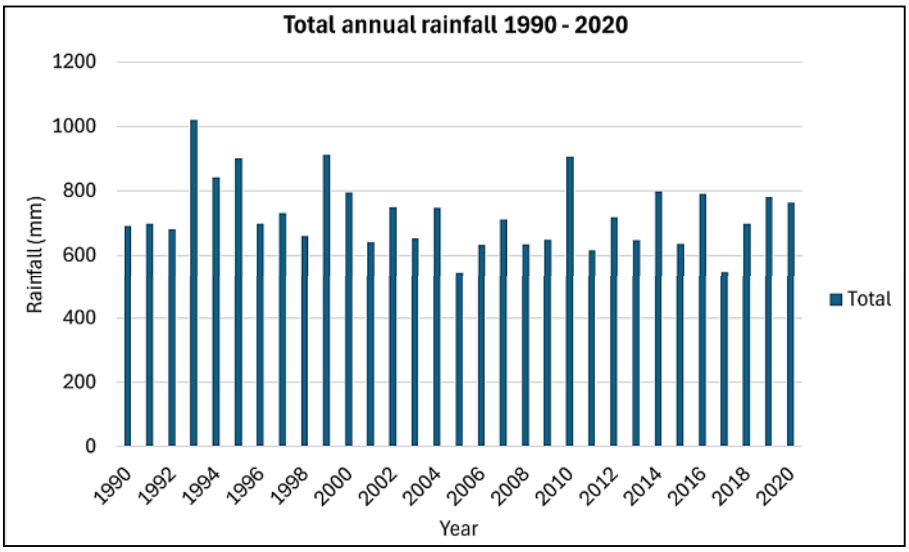

Figure 24: Annual rainfall in Queenstown from 1990 – 2020. Data source: NIWA climate database (StatsNZ 2023).

NIWA's annual climate summaries give results for sunshine hours and mean temperatures in Queenstown. From 2020 – 2024 the average annual sunshine hours was 2,338 and the mean temperature was 10.5°C (NIWA 2025).

The overall climate in Queenstown consists of warm summers, typically 20 – 30°C during the day and cold winters with occasional low elevation snowfall. Table 14 provides a summary of seasonal rainfall from 1990 - 2020 (StatsNZ 2023). Rainfall is typically highest in spring and summer due to the influence of westerly winds and frontal systems. Queenstown is situated on the eastern side of the Southern Alps. The prevailing westerly winds bring moist air from the Tasman Sea, which rises over the mountains, cools, and condenses, leading to precipitation (NIWA 2015).

Table 14: Seasonal rainfall summary from 1990 – 2020. Data sourced from NIWA Climate Database (StatsNZ 2023)

Season	Min (mm)	Max (mm)	Average (mm)
Autumn	103.4	271.6	179.3
Spring	70.3	333.2	181.0
Summer	83.6	454.8	190.5
Winter	100.4	273.1	175.0

Figure 25 presents a wind rose generated from wind data collected at the nearby Queenstown Airport meteorological station. This data has been used to inform the odour assessment described in Section 5.

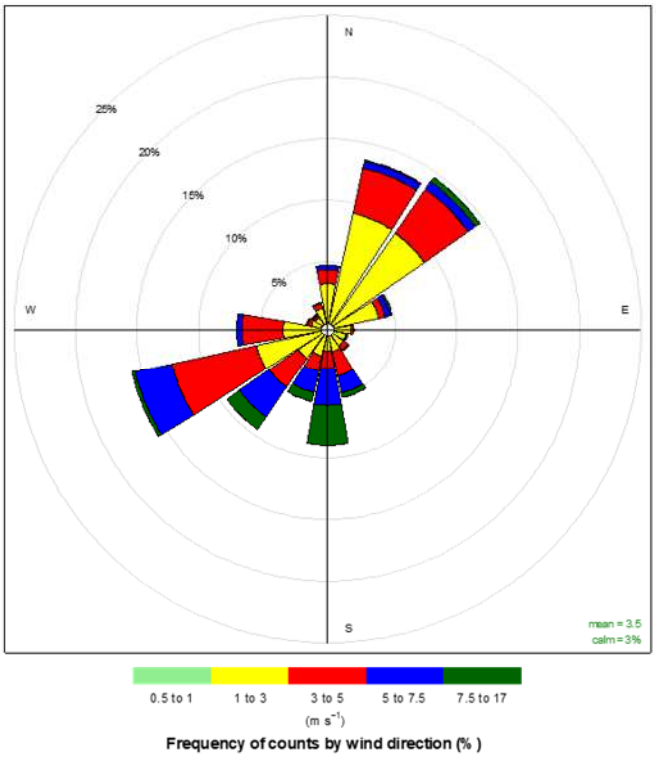

Figure 25: Queenstown Airport wind data presented as a windrose (2022 to 2024 – years inclusive)

3.3 Groundwater

3.3.1 Hydrogeology

The GHD technical WQ report (attached as Appendix A) provides the following information about the hydrogeological setting and location Shotover Delta.

3.3.1.1 Setting

The glacial geology within the Wakatipu basin has resulted in a series of small, disconnected aquifer zones. These aquifers comprise glacial outwash gravels, lake fans and alluvium containing sand, silt and gravel. The presence of bedrock and/or low permeability lake silt or glacial till separates the permeable aquifer zones from other areas. These aquifer zones have been collectively mapped as the Wakatipu Basin aquifer by ORC[17].

[17] ORC Aquifer Map C4, c-map-series-c4.pdf

The Wakatipu Basin Aquifer encompasses the Kimi-ākau/Shotover Riverbed from approximately 2 km downstream of Arthurs Point to Shotover Downs, approximately 1 km upstream of the SH6 Bridge. From Shotover Downs, the Wakatipu Basin Aquifer is mapped only to cover a portion of the riverbed on the true left bank of the Kimi-ākau/Shotover River. The WWTP site and location of the discharge structure are outside of the mapped aquifer zone.

QLDC abstract groundwater from a series of groundwater bores on the true left bank of the Kimi-ākau/Shotover River (opposite riverbank to the Shotover WWTP), approximately 1.5 km upstream of the confluence with the Kawarau River. The bores are screened at approximately 30 - 45 m depth. Bore logs for the production bores show a thick sequence of sandy gravels from near surface to the base of the bores.

3.3.1.2 Shotover Delta

Extensive investigations were undertaken in and around the Shotover Delta to characterise the groundwater environment and the effects of the DAD discharge on groundwater in accordance with the EO REMP (GHD Ltd, 2025b). These investigations comprised drilling of boreholes and installation of groundwater monitoring wells, hydraulic testing of aquifer properties, test pitting, monitoring for groundwater levels and groundwater quality.

A brief overview of the Shotover Delta aquifer is provided below:

- Aquifer comprises alluvial gravels with variable proportions of silt and sand.
- Groundwater levels are shallow, with a strong hydraulic connection to surface water (particularly Kimi-ākau/Shotover River).
- The groundwater flow direction is generally towards the south (approximately parallel to the direction of Kimi-ākau/Shotover River flow). Therefore, groundwater within the delta will flow towards the Kawarau River, likely discharging from the gravel alluvium as seeps into the River.
- Due to the variability of depositional setting (braided river) it is expected that preferential groundwater flow paths exist with lenses and/or channels of higher permeability gravels and sands and lower permeability sands and silts, controlling local flow and hydraulic connectivity..
- Monitoring shows distinct seasonality in the groundwater levels, with elevated groundwater and river levels during spring due to a combination of seasonal weather patterns and snow melt.
- Groundwater quality reflects upstream (Kimi-ākau/Shotover River) inputs and activities on the delta, such as discharge from the DAD.

3.3.2 Groundwater Quality

The GHD WQ report provides details on the groundwater quality of the Delta and Figure 3.23 of that report shows the locations of monitoring wells that have been installed and monitored generally monthly since March 2025. It summarises the groundwater quality data as having the following general patterns:

Table 15: Groundwater summary (Source: GHD technical report)

Parameter	Comment
Spatial Distribution	The influence of wastewater discharges on groundwater quality is widespread across the Shotover Delta with highest contaminant concentrations directly down gradient of the DAD. Wells that are located oblique to the main groundwater flow path (eg BH03, BH22 and BH23) show a smaller proportion of wastewater influence. Only the upgradient wells BH01 and BH02 show no influence of wastewater impact.
Depth	Wastewater contaminants are generally higher in shallow wells compared to deep wells. The exception to this is monitoring well pair BH19 and BH20, which are both screened in gravel over a low permeability sand layer. The low contaminant concentrations in BH18 indicates that most of the flow is through the overlying sandy gravel.
Trends	Most wells show a reduction in the main wastewater contaminant, ammoniacal-N, with concentrations decreasing by half or more in many wells over the past year. BH09 is an exception, with a small increase in concentration to a similar level to match BH08 (paired shallow well). DRP concentrations are generally low, however there is some variability over time and spatial distribution. Unlikely mobile nitrogen species, phosphorous mobility is influenced by adsorption to fine sediments, which varies both spatially and over time with variable groundwater levels.

3.4 Surface Water

Section 3.3 of the GHD WQ report provides a detailed description of the hydrological setting and has been summarised below.

3.4.1 River Morphology & Flows

The Kimi-ākau/Shotover River catchment produces high flows, which typically peak before the outflow from the lake. Under some conditions, the Kimi-ākau/Shotover flood can produce a return flow up the Kawarau River to Lake Wakatipu. In response to past events and flooding in Queenstown, construction of the flood training line on the true right of the river delta by ORC has permanently altered the hydrology of the river during flood conditions. Where historically Kimi-ākau/Shotover River waters entered the Kawarau River across the full extent of the confluence (approximately 1300 m width), flow is now constrained to approximately half of the delta.

A series of aerial imagery photos in Section 3.3.2.2 of the GHD WQ report illustrate the significant change in the Shotover Delta following construction of the flood training line. The main channel of the Kimi-ākau/Shotover River now appears more stable and entrenched, with reduced delta extent and increased vegetation on former gravel bars, indicating long-term stabilisation and reduced channel mobility.

Cross section surveys performed on the Kawarau indicate that its depth varies given the season and location.

High flows in both the Kawarau River and Kimi-ākau/ Shotover Rivers typically occur in spring, due to a combination of snow melt and westerly weather patterns resulting in heavy rainfall in the upper catchment (GHD Ltd, 2025a). However, river flows in the Kawarau River are disturbed by floods to a lesser extent than the Kimi-ākau/Shotover River due to the buffering effect of Lake Wakatipu. The Kimi-ākau/Shotover River responds rapidly to rainfall, with flood flows characterised by high sediment load and turbid waters due to the geology and topography of the headwaters.

Flow monitoring shows the timing of seasonal highs and lows remains consistent, and even during drier years the Kawarau River maintains comparatively high baseflows, reflecting the strong buffering influence of Lake Wakatipu, resulting in predictable and relatively stable seasonal flow behaviour (refer to Figure 3.12 in the GHD WQ report).

Table 16 below shows that the highest average and median flows in both the Kawarau and Kimi-ākau/ Shotover Rivers occur over spring and summer. The mean annual low flow (MALF) for the Kawarau at Chard Rd is in the order of 83 m^3/s.

Table 16: Flow statistics from ESNZ monitoring site data. All flows in m3/s (taken from Table 3.2 of GHD Technical Report)

10-yr and 1-yr flow statistics					
Location		10 yr mean	10 yr median	10 yr min	10 yr max
Kawarau at Chards Rd		207.2	184	71.2	692.6
Shotover at Bowens Peak		36.2	27.6	9	338.2
		1 yr mean	**1 yr median**	**1 yr min**	**1 yr max**
Kawarau at Chards Rd		242.4	177.8	76.2	692.6
Shotover at Bowens Peak		45.2	30.5	9.6	338.2
Seasonal flow statistics					
		Spring	**Summer**	**Autumn**	**Winter**
Kawarau at Chards Rd	10 yr seasonal average	275.1	225.5	168.8	167.2
	10 yr seasonal median	252.6	202.4	154.2	148.0
Shotover at Bowens Peak	10 yr seasonal average	56.1	32.8	26	31.7
	10 yr seasonal median	44.9	26.7	19.8	24.7

Notes: 10-year statistics calculated from 01 March 2016 to 01 March 2026 1-year statistics calculated from 01 March 2025 to 01 March 2026

3.4.2 Hydrodynamics

A bathymetry survey was undertaken by Easth Sciences New Zealand (ESNZ) in March 2026 to provide information on channel depth and flow velocity to support outfall design and effects modelling.

Visual profiles of the velocity at each transect demonstrate that water flows slower along both riverbanks and at higher velocities through the middle of the channel (see Figure 3.16 to Figure 3.18 in the GHD technical report). Near the margins, velocities are lower due to shallow depths, increased friction from the banks, and interactions with bed and bank roughness. In contrast, the central portion of the channel shows higher velocities, reflecting greater flow depth and reduced boundary resistance.

Figure 26 below provides the river velocity characteristics at the location of the proposed outfall structure (cross-section CX3).

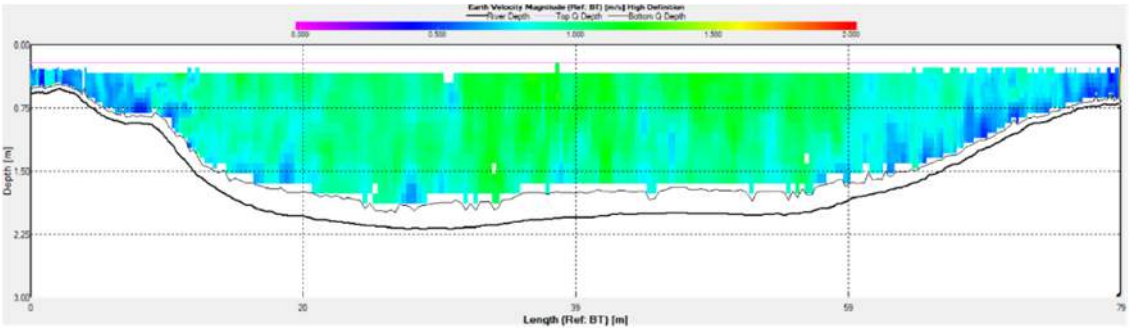

Figure 26: CX3 profile (ESNZ, 2026, taken from GHD technical report Figure 3.14)

3.4.3 Surface Water Quality

3.4.3.1 Relevant water quality assessment criteria

In the GHD WQ report, the relevant water quality criteria from the National Policy Statement for Freshwater Management 2020 (NPS-FM), Regional Plan – Water for Otago (RPW) and The Water Conservation (Kawarau) Order 1997 (WCO) that are then used in the subsequent assessment of effects have been summarised, with the key criteria being:

- NPS-FM (2020)
    - Sets national freshwater quality limits and objectives, giving effect to *Te Mana o te Wai* and establishing minimum expectations for river health.

- Uses attribute states (A–D) to classify water quality based on measured parameters, enabling consistent assessment, trend tracking, and evaluation against objectives and bottom lines.

- RPW (Schedule 15)
  - Defines region-specific water quality limits, target values, and characteristics for rivers and lakes, using both qualitative and quantitative measures.
  - Table 15.2.2 (RWP) sets limits and timeframes for key parameters (e.g. nitrate-nitrite nitrogen, DRP, ammoniacal-N, E. coli, turbidity) for rivers including the Kawarau River.

- WCO
  - A national instrument with primacy over regional plans and resource consenting, applying to the Kawarau River system (including the Kimi-ākau/Shotover River).
  - Requires protection of outstanding natural and recreational values and imposes mandatory water quality management requirements on activities to meet Class CR contact recreation standards, after reasonable mixing, as outlined in the Schedule 3 of the RMA:

    > *"5 Class CR Water (being water managed for contact recreation purposes)*
    >
    > *(1) The visual clarity of the water shall not be so low as to be unsuitable for bathing.*
    >
    > *(2) The water shall not be rendered unsuitable for bathing by the presence of contaminants.*
    >
    > *(3) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water."*

The WCO establishes the highest level of protection, constraining how relevant water quality and activities are managed. The NPS-FM sits alongside the WCO by setting the national framework for freshwater management, but it does not override the protections of the WCO. Within this context, Schedule 15 of the RPW translates regional policy and Order requirements into region-specific numerical limits, which are commonly used as practical benchmarks for consent assessment and water quality monitoring where they are consistent with, and do not undermine, the WCO, however the RPW has not been updated since the introduction of the NPS-FM. The relevant limits from the NPS-FM and RPW Schedule 15 are referenced in Section 5.5 of the GHD WQ report and included in Appendix A and Table 18 below).

3.4.3.2 Monitoring results

Figure 27 shows the location of surface water monitoring locations where weekly and monthly samples have been collected since March 2025.

Figure 27: Surface water monitoring locations (Sourced from GHD WQ Report – Figure 3.27))

The annual median and 95th percentile values of the upstream (RS14) and downstream (RS10) monitoring locations in the Kawarau River are provided in Table 17 below. Ammoniacal-N and Nitrate-N 95th percentile concentrations are consistent with Attribute Band A criteria of the NPS-FM both upstream and downstream. The DRP

95th percentile for RS14 is consistent with Attribute Band A criteria, while RS10 falls into Attribute Band B criteria, however a Wilcoxon signed-rank test indicated that the results between RS10 and RS14 were not statistically different for Ammoniacal-N, Nitrate-N and DRP.

Table 17: Annual median and 95th percentile values for Kawarau River monitoring locations (source: GHD technical report).

Parameter	Ammoniacal-N (adjusted for pH 8 at 20°C) (mg/L)		Nitrate-N (mg/L)		Dissolved Reactive Phosphorus (mg/L)	
Location	Median	95th percentile	Median	95th percentile	Median	95th percentile
RS10 (downstream)	0.01	0.02	0.036	0.07	0.005	0.024
RS14 (upstream)	0.001	0.001	0.031	0.08	0.006	0.006
NPS-FM A Band	<0.03	<0.05	<1.0	<1.5	<0.006	<0.021
NPS-FM B Band	0.03-0.24	0.05-0.40	1.0-2.4	1.5-3.5	0.006-0.010	0.021-0.030
NPS FM National Bottom Line	0.24	0.4	2.4	3.5	0.018*	0.054*
Notes: *NPS FM Attribute Band D value (as no National Bottom Line) - Noting that NPS FM DRP criteria is based on monthly monitoring over 5 years						

The water quality within the Kawarau River downstream (RS10) of the confluence has also remained within the RPW Schedule 15 criteria (Table 18).

Table 18: 80th percentile concentrations at or below median flow (179.1 m3/s) in Kawarau River (source: GHD technical report)

Location	Parameter	Nitrate-nitrite nitrogen	DRP	Ammoniacal-N	Ammoniacal-N (adjusted for pH 8 at 20°C)	*E. coli*	Turbidity
	Unit	mg/L	mg/L	mg/L	mg/L	cfu/100ml	NTU
	Date range	80th percentile	80th percentile	80th percentile	80th percentile	80th percentile	80th percentile
RS10 - Kawarau River downstream of Shotover delta	11/03/2025 - 18/03/2026	0.041	0.007	0.03	0.012	26	57*
RS14 - Kawarau River upstream of Shotover delta	11/03/2025 - 10/03/2026	0.05	<0.002	0.01	0.001	70	1.4
ORC Regional Plan - Schedule 15, Water Group 2, water quality criteria		0.075	0.01	0.1	0.1	260	5
Notes: *Natural sediment induced turbidity							

Overall, the influence of current surface water and groundwater discharges from the Shotover WWTP and DAD disposal field do not appear to have a more than minor cumulative effect on water quality immediately downstream of the confluence.

A summary of metals results for copper, zinc and aluminium in the Kawarau River results (and upstream on the Kimi-ākau/Shotover River) indicate that some of the background concentrations already exceed ANZG Default Guideline Values[18]. Elevated concentrations of aluminium observed in the Kimi-ākau/Shotover River relative to the Kawarau River are interpreted to reflect natural background conditions associated with catchment geology and mineralogy, rather than related to effects from current wastewater discharge.

Section 3.6.2.7 of the GHD technical report highlights the effects of the existing groundwater discharges downgradient from the DAD on the shallow surface water quality of the Kawarau River adjacent to the riverbanks and shallow groundwater on the Delta. It concludes that:

- Nutrient concentrations in riverbank waters of Kawarau River increase significantly relative to upstream (RS14) water quality, as river water flows past the Shotover Delta due to the influence of groundwater discharges.
- The influence of groundwater discharges to the Kawarau River water quality are greatest under low river flow conditions. Where low flow periods persisted for long periods (such as March-April 2025) ammonia concentrations likely exceeded national bottom line limits in riverbank waters.
- Impacts to groundwater quality from operation of the DAD, has resulted in effects to river water quality, which were likely unexpected at the time of consenting the discharge via the DAD.

3.5 Natural Hazards

A summary of flood flows, patterns, and how they vary in the Kawarau River are described in section 3.4.1 above, with the other key natural hazard risk for the site being in relation to earthquakes.

The primary hazards presented by earthquakes are rupture or deformation of the ground surface along the trace of a fault, and the shaking caused by seismic waves generated by movement along a fault during an earthquake. The primary active fault in the Wakatipu Basin area is the Nevis-Cardrona Fault System, which transects the Kawarau Gorge in the western Gibbston Basin (ORC, 2015[19]). Given the location of this fault, it would

[18] Refer to section 3.6.2.6 of the GHD WQ Report

[19] ORC (August 2015) Seismic Hazard in Queenstown Lakes District. Written by Ben Mackey, Natural Hazard Analyst.

have the greatest direct effect in the Kawarau Valley downstream from the outfall and WWTP location, where there is a risk of a 1-2m vertical offset rupture (ORC, 2015).

Approximately 75 km to the northwest of Queenstown, the 600 km long Alpine Fault presents the major seismic hazard to the area. Secondary risks from a rupture of this fault for the WWTP site include liquefaction, with the location of the WWTP, pipeline and outfall identified as being within an area of low to moderate liquefaction risk (Figure 40, ORC, 2015). Rockfall risk in the upper Kimi-ākau/Shotover River catchment may also result in flood flows downstream towards the Delta and long-term increases in sediment transport after any large earthquake may lead to increased aggradation at the Shotover/Kawarau confluence for several decades.

3.6 Ecology

Section 6 of the EcIA (attached as Appendix B) provides details on the broader ecological context of the area. The following summaries of site specific terrestrial and aquatic ecological values have been taken from that report.

3.6.1 Terrestrial Vegetation

There are eight main (broad) vegetation types within the proposed pipeline alignment:

- Buddleia scrub
- Buddleia shrubland
- Crack willow forest
- Crack willow treeland
- Gravelfield (gravel roads / tracks and open areas of river gravels)
- Hemlock-Russell lupin herbfield
- Stonecrop herbfield
- Tree lupin shrubland

These vegetation types, including photos of the location and extent of each, are described further in the Boffa Miskell ecology report.

With the exception of some areas of gravelfield which support a low diversity of degraded, sparse indigenous turf species, these vegetation types are entirely, or almost entirely dominated by weedy plant species. The ecology report concludes that overall, all of these vegetation types are of low of negligible ecological value.

The vegetation and habitats within the construction footprint are not ecologically significant under the criteria for determining ecological significance in the Queenstown Lakes Proposed District Plan) (QLPDP), Proposed Otago Regional Policy Statement (RPS) and Appendix 1 of the National Policy Statement for Indigenous Biodiversity (NPS-IB).

Areas within and adjacent to the proposed wastewater pipeline and outfall footprint are generally highly modified. Modifications include willow planting, gravel extraction and quarrying activities, four wheel drive and motorbike recreational use, track formation, flood protection works, and associated weed colonisation.

3.6.2 Avifauna

Habitats for birds within and adjacent to the proposed pipeline alignment and rock outfall structure are terrestrial habitats (crack willow forest and treeland, scrub and shrubland and gravelfield) as well as braided river (the Kimi-ākau/Shotover River and delta) and river (Kawarau River) habitats in the vicinity of the rock outfall structure, and the now decommissioned oxidation ponds.

The key species identified at the site based on desktop review, site visit observations and the habitats present on site, include one Threatened species (black-fronted tern), seven At Risk species (banded dotterel, black-billed gull, New Zealand pipit, South Island pied oystercatcher, Australian coot, black shag and little shag) and 19 Not Threatened species. These are shown in Table 19 taken from the ecology report.

Table 19: Bird species recorded within the NZ Bird Atlas (grid square DP18), in existing data and reports, and recorded during the site visit that are likely to utilise habitats within or adjacent to the proposed pipeline and rock outfall construction footprint. Sorted by indigenous / introduced and by conservation status (Robertson et al., 2021) (extracted from EcIA)

Common Name	Scientific Name	Conservation Status	eBird Square DP18	Existing data / reports	Site visit observation
Black-fronted tern	*Chlidonias albostriatus*	Threatened – Nat. Endangered	x	x	
Banded dotterel	*Anarhynchus bicinctus*	At Risk - Declining	x	x	x
Black-billed gull	*Chroicocephalus bulleri*	At Risk - Declining	x	x	x
New Zealand pipit	*Anthus novaeseelandiae*	At Risk - Declining	x	x	
South Island pied oystercatcher	*Haematopus finschi*	At Risk - Declining	x	x	x
Australian coot	*Fulica atra*	At Risk - Naturally Uncommon	x	x	
Black shag	*Phalacrocorax carbo*	At Risk - Relict	x	x	x
Little shag	*Phalacrocorax melanoleucos*	At Risk - Relict	x	x	x
Australasian shoveler	*Spatula rhynchotis*	Not Threatened	x	x	
Bellbird	*Anthornis m. melanura*	Not Threatened	x	x	

Black swan	*Cygnus atratus*	Not Threatened	x	x	
Grey teal	*Anas gracilis*	Not Threatened	x	x	x
Grey warbler	*Gerygone igata*	Not Threatened	x	x	
Kingfisher	*Todiramphus sanctus vagans*	Not Threatened	x	x	
New Zealand scaup	*Aythya novaeseelandiae*	Not Threatened	x	x	
Paradise shelduck	*Tadorna variegata*	Not Threatened	x	x	x
Pied stilt	*Himantopus leucocephalus*	Not Threatened	x	x	
Pukeko	*Porphyrio melanotus*	Not Threatened	x	x	
Shining cuckoo	*Chrysococcyx lucidus*	Not Threatened	x	x	
Silvereye	*Zosterops lateralis*	Not Threatened	x	x	x
South Island fantail	*Rhipidura f. fuliginosa*	Not Threatened	x	x	
South Island tomtit	*Petroica m. macrocephala*	Not Threatened	x	x	
Southern black-backed gull	*Larus dominicanus*	Not Threatened	x	x	x
Spur-winged plover	*Vanellus miles*	Not Threatened	x	x	x
Swamp harrier	*Circus approximans*	Not Threatened	x	x	
Tui	*Prosthemadera n. novaeseelandiae*	Not Threatened	x	x	
Welcome swallow	*Hirundo neoxena*	Not Threatened	x	x	x
White-faced heron	*Egretta novaehollandiae*	Not Threatened	x	x	

3.6.3 Freshwater values

3.6.3.1 Habitat quality and availability

Physical habitat condition across the Kawarau River sites ranged from marginal to sub-optimal, reflecting the characteristics of a mobile gravel-bed system dominated by small cobble, gravel and sand substrates. Habitat variability was limited, although some localised differences were associated with the presence of periphyton, willow root mats and macrophytes. Invertebrate habitat was reduced at RS11 and RS13 due to didymo or sludge mats and deposited sediment, while fish habitat was generally constrained across all sites (≤30% cover) by a lack of stable refuge features such as large wood or overhanging vegetation. Hydraulic conditions were dominated by run habitat, with a deep, fast-flowing thalweg and slower margins, consistent with broader bathymetric patterns.

Riparian margins provide minimal shading and structural input, comprising mainly bare gravels and scattered willows on the true left bank, and steeper banks with exotic shrubs

and grasses on the true right. All sites were classified as sub-optimal, except for RS11 (the proposed discharge location), which was assessed as marginal due to high deposited sediment and limited fish cover diversity.

3.6.3.2 Periphyton and macrophytes

During the site investigation in March 2026, periphyton cover in the Kawarau River was generally low, consistent with an oligotrophic, mobile gravel-bed system. Sites RS10, RS12 and RS14 were dominated by bare substrate, each recording over 75% average cover of no algae. In contrast, RS11 (the proposed discharge location) supported moderate didymo cover (approximately 35%), while RS13 exhibited extensive sludge mats (approximately 65%). These localised increases are likely influenced by reduced slower local velocities and greater substrate stability along the true-left margin, with RS11 characterised by a high proportion of small cobbles that provide favourable surfaces for periphyton colonisation. Conditions at RS11–RS13 may also be influenced by localised nutrient inputs associated with DAD overflow and groundwater interactions.

Despite these local variations, Periphyton Weighted Composite Cover (PeriWCC) values were below 2% at all sites, indicating an absence of significant filamentous algae and placing all sites within the 'excellent' ecological condition class[20]. Macrophytes were sparse and limited to small, isolated patches, with Myriophyllum triphyllum present at most sites and low densities of Lagarosiphon major at RS13 and RS14. These did not materially influence habitat condition or periphyton assessments.

3.6.3.3 Macroinvertebrates

A total of 31 macroinvertebrate taxa were recorded across the Kawarau River sites, including 12 EPT taxa (mayflies, stoneflies and caddisflies). Taxa richness and EPT richness were lowest at RS12 and highest at RS10 and RS14. Despite this variation, community composition was consistently dominated by pollution-tolerant taxa, with Cladocera accounting for more than half of total abundance at all sites (and up to approximately 80% at RS14), likely reflecting drift from Lake Wakatipu. Other abundant taxa included oligochaete worms, Potamopyrgus snails, and dipterans such as Chironomus and *Orthocladiinae*, with only a single hydroptilid caddisfly (Oxyethira) recorded.

Macroinvertebrate indices reflected generally degraded ecological condition. MCI and QMCI scores were mostly within the 'poor' class, with RS10 and RS13 marginally reaching 'fair', although nearly all sites remained below the NPS-FM national bottom lines. ASPM scores were also below the national bottom line at all sites, reflecting low EPT abundance (<25%). Localised improvements at RS13 and RS14 were associated with higher proportions of taxa such as Deleatidium and *Cladocera*, but overall communities were characterised by low sensitivity taxa and sub-optimal ecological health. These results

[20] Shotover WWTP Periphyton Risk Assessment (Boffa Miskell) – attached as Appendix B2

are consistent with historical data for the Kawarau River, and no additional species (e.g. kākahi or kōura) were identified through eDNA records.

Overall, macroinvertebrate communities in the Kawarau River were characterised by low EPT abundance, dominance of tolerant taxa, and index scores that were below or only marginally above national bottom lines. These results are consistent with wider patterns reported for the river; at Chard Road, the 5-year median MCI (82.1) and QMCI (2.1) recorded between 2017 and 2021 was also below the NPS-FM national bottom lines

3.6.3.4 Fish

Fish community characterisation for the Kawarau River, supported by eDNA (including at the proposed discharge location) and NZFFD data, identifies the presence of longfin eel (A*nguilla dieffenbachii*; At Risk – Declining), common bully (*Gobiomorphus cotidianus*; Not Threatened), and introduced salmonids (rainbow and brown trout). Field observations confirm common bullies as resident within the reach. The river is also identified in the RPW (Schedule 1A) as important habitat for kōaro (*Galaxias brevipinnis*; At Risk – Declining). While habitat at the discharge location is not optimal, kōaro may utilise the reach for passage given established connectivity with tributaries to Lake Wakatipu.

Additional records from tributaries include unidentified galaxiids and perch, with chinook salmon also potentially present on an infrequent basis due to broader catchment connectivity. Fish passage within the system is influenced by downstream hydroelectric dams, which constrain eel migration despite trap-and-transfer operations. No publicly accessible information indicates the presence of native fish or trout spawning habitat within the main stem of the Kawarau River. However, a local angler described two trout spawning locations on the Kawarau near the proposed discharge location. One location is near RS13, upstream of the proposed discharge location. The other location is directly upstream of a gravel island near the true-right side of the River, opposite the confluence with the Kimi-ākau/Shotover River.

3.6.3.5 Freshwater ecological values

An ecological value assessment has been applied at the reach scale between Lake Wakatipu and the Lake Dunstan inlet, representing the section of river potentially influenced by the Project and for which ecological data are available. While this scale is appropriate, Boffa Miskell note that ecological data were primarily collected in the Kawarau River at, and adjacent to, the Kimi-akau/Shotover River confluence, where effects are expected to be more likely.

The Kawarau River scores High for representativeness, rarity and distinctiveness and ecological context, and Moderate for diversity and pattern and ecological integrity (refer

to Table 8 in the Boffa Miskell report). The overall ecological value of the Kawarau River is High using the EIANZ guidelines[21].

The Kawarau River was assessed against the APP2 criteria in the Proposed ORPS for identifying Significant Natural Areas, using the Remarkables Ecological District as the assessment context. The river meets multiple APP2 attributes and is therefore considered ecologically significant (Table 11 of EcIA report).

This outcome is consistent with Schedule 1A of the ORC Regional Plan and the WCO, both of which recognise the Kawarau River for its outstanding amenity and intrinsic values. Sports fish (salmon and trout) are also identified as ecosystem values under Schedule 1A.

3.7 Recreation

An assessment of the recreational values of the receiving environment, guided by stakeholder interviews, has been provided in the Rec Report (Appendix C). The below summary of the recreational values of both the immediate and wider receiving environment come from that report.

3.7.1 Immediate environment

The Kimi-ākau/Shotover River is a fast-flowing river of approximately 75 km in length, originating in the Southern Alps and characterised by numerous rapids and gorge sections of significant scenic and recreation value. The Kawarau River flows eastward from Lake Wakatipu, constituting the lake's only natural outlet, and passes through dramatic scenic gorge terrain before joining the wider Clutha/Mata-Au catchment. Together, these two river systems form one of the most visited and intensively used river recreation environments in New Zealand.

The Kimi-ākau/Shotover River and delta has high levels of use for a wide variety of terrestrial and water-based activities including walking, mountain biking and cycling, motocross and ATVing, four wheel driving, dog walking, and general family recreation as well as small boat activity including kayaking, whitewater rafting and pack rafting, riverboard surfing, and stand-up paddle boarding (SUP). Tourism is one of the major draws to this area with jet boating being an extremely popular recreation and tourism activity. Fishing is also a very popular tourism and recreation activity. Stakeholder interviews with local anglers also noted that there were trout spawning beds upstream and across the river from the proposed discharge point, although the ecological testing by Boffa Miskell (summarised in the EcIA) did not note any spawning areas within the study area.

[21] Roper-Lindsay et al (2018)

Located on the true right bank of the Kimi-ākau/Shotover River, the informal recreation zone is managed by QLDC, sits in close proximity to the proposed rock outfall structure and, via Shotover Delta Road, functions as the primary arrival point for people accessing the lower Shotover environment on foot, by bike via the Twin Rivers/Queenstown Trail, or by launching small watercraft such as kayaks. This makes it one of the closest and most common public access locations relative to the proposed discharge site.

Commercial operators, including Shotover Jet, Thunder Jet, Queenstown Rafting/RealNZ, and KJet, each maintain their own operational bases and utilise a combination of shuttle services and water-based access to bring customers to and from their respective activity zones on the Kimi-ākau/Shotover and Kawarau rivers. These commercial access patterns are layered over the broader public access network described above and in the Rec Report and further intensify the recreational use of the receiving environment.

3.7.2 Wider environment

Beyond the immediate receiving environment at the proposed outfall and confluence margin, the wider recreation environment includes the Kawarau River downstream from the Kimi-ākau/Shotover confluence, the adjacent Twin Rivers Trail corridor, and the broader Kawarau corridor extending through the Gibbston Valley. This area is defined as the area outside the immediate study area, mainly downstream from the proposed discharge and upstream of the discharge close to Lake Wakatipu.

The Kawarau reach downstream of the confluence supports a mix of informal and commercial recreation, with nationally significant whitewater recreation areas (e.g., the four significant rapids on the commercial rafting stretch - Smiths Falls, Twin Bridges, Do Little Do Nothing, and the 400m Dog Leg), located approximately 9km downstream of the outfall. The Twin Rivers Trail corridor runs along the downstream section of the Kawarau and provides public access to the Kawarau and lower Kimi-ākau/Shotover margins, including viewpoints, rest points and local access nodes such as Billies Bridge. This corridor is used for walking, cycling, sightseeing, stopping at river beaches, and accessing the river margin, and it forms part of the setting through which many local residents and visitors experience the Kawarau–Shotover confluence and downstream river environment.

The wider river corridor downstream of the confluence is also used by commercial recreation operators. This includes KJet operations on the Kawarau and Kimi-ākau/Shotover Rivers, commercial float trips and rafting activities, river boarding, and kayaking in reaches downstream of the confluence, as well as the broader Kawarau River through the Gibbston Valley, which is used for commercial rafting and associated visitor experiences.

3.8 Geology

The GHD WQ report (Appendix A) provides a summary of the local geology, an overview of which is provided below.

The Queenstown area is underlain by schist and semi-schist of the Torlesse and Caples supergroup. The schist forms the mountain ranges and high points (e.g. Morven Hill) in and around the Wakatipu Basin. The basin geology is influenced by multiple glacial advances, carving out the basin and leaving behind glacial sediments (till and outwash gravels) as the glaciers retreated.

Frankton flats and the Shotover Delta are underlain by recent (Holocene) alluvial and fan deposits, comprising unconsolidated gravel, sand and silt.

Following geological investigations by GHD, they have confirmed that the geology underlying the delta is predominantly a gravelly fine to coarse sand or sandy gravel with some cobbles. The gravel is made up of subrounded to subangular schist fragments. However, there are lenses or layers with fine sand and silt. The following geological profile is available for the Shotover delta:

- Gravelly fine to coarse sand at surface extending for 1-2 m
- A layer of sandy gravel, ~1 to 2.5 m thick
- Gravelling fine to coarse sand extending to at least 20 m depth below ground level (based on the logs of IH2 and IH3)
- A fine silty sand is present near the Kawarau River (BH17 and 18) extending to at least 9 m depth. It is not known whether this sand continues deeper or is underlain by more permeable coarse sand or gravel.

3.8.1 Contaminated Land

Prior to 2010, when construction work began on the Queenstown Airport runway extension, there were numerous industrial uses of the area on the western side of the Delta. Some of these uses include timber yard, storage of construction materials and likely disposal of various wastes. Imagery from prior to 2010 has been examined to determine whether any of those past uses (potential HAIL activities[22]) that may have resulted in contamination of the soil would have occurred along the proposed pipeline alignment from the UV outlet to the Kawarau River.

Figure 28 is representative of the land uses and location that occurred prior to the establishment of the runway extension and construction of the ORC training line. As can be seen in this image, the proposed pipeline location is within an area that was formerly active riverbed prior to the training line construction, and the potentially contaminating

[22] *Hazardous Activities and Industries List* - as per National Environmental Standards for Assessing and Managing Contaminants in Soil (NES-CS)

land uses were located approximately 100m to the west. It is therefore unlikely that there will be any contaminated land located within the area of land to be disturbed.

Figure 28: Aerial imagery from November 2004 (via GoogleEarth) illustrating the location of the timber yard to the west of the training line (approximated with orange line)

3.9 Landscape and Natural Character Values

The below summary of values has been summarised from the LNCA report (Appendix D).

The site is located within the Kawarau– Kimi-ākau/Shotover river confluence, a highly valued Outstanding Natural Feature characterised by the interaction of two contrasting river systems within a dynamic alluvial floodplain. At a landscape scale, the environment exhibits very high physical, perceptual and associative values, reflecting the strong expression of geomorphic and hydrological processes, highly legible river forms, and a visually coherent river corridor framed by terraces and the Remarkables backdrop. These values are reinforced by the rivers' outstanding scenic qualities, national recognition (including the WCO), and their role as important cultural and recreational landscapes, including as wāhi tūpuna with strong Kāi Tahu associations and extensive public use for recreation.

At the local (project area) scale, landscape values remain moderate–high to very high overall, although they are influenced by existing modification associated with river training works, gravel extraction, infrastructure (including the WWTP, SH6 bridge and transmission lines), and informal recreation activities. Physical attributes remain dominated by braided river processes (albeit controlled, especially by the training line), active floodplain dynamics, and the geomorphic significance of the confluence, while perceptual values derive from the dynamic and expressive river environment, scenic quality, and framed views along the corridor. Associative values are particularly strong, reflecting cultural connections (whakapapa, mahika kai, and traditional travel routes), historic gold mining activity, and widespread recreational use, which collectively contribute to a landscape that is highly valued and widely recognised.

Natural character within the receiving environment varies across the river systems, reflecting the degree of modification. The Kawarau River within the reach of the site retains a high level of natural character, with strong abiotic, biotic and experiential attributes including high water quality, coherent channel form, and a strong sense of naturalness. In contrast, the Shotover Delta exhibits a moderate level of natural character, where natural river processes remain evident but are moderated by flood protection works, vegetation modification and adjacent land uses. At a reach scale, the natural character of the environment is therefore characterised by a continuum from highly natural river conditions to more modified floodplain margins, with the confluence area retaining strong natural process dominance within a highly modified setting.

3.10 Cultural Values

QLDC recognises that Ka Rūnaka exercise rakatirataka within the Kāi Tahu Takiwā and are mana whenua of the Kawarau River and surrounding area. QLDC also acknowledges the importance of the awa to iwi and recognises that Ka Rūnaka maintain a role as kaitiaki (guardians).

As discussed in section 1.2, Ka Rūnaka do not support the application and have not provided an assessment of the cultural values for this application. The information in this section is provided from:

- consultation and discussions with iwi through the optioneering process and fortnightly project meetings over the past 12 months;
- the Kāi Tahu position statement on shortlisted options, provided to QLDC on 28 October 2025;
- the cultural impact assessment associated with the short-term emergency discharge application to the Kimi-ākau/Shotover River, provided by Te Ao Marama Inc on 4 August 2025 attached as Appendix M;
- the Ngāi Tahu Treaty settlement;
- the Iwi Management Plans of Kāi Tahu ki Otago and Ngāi Tahu ki Murihiku; and

- the Proposed Otago Regional Policy Statement (RPS); and
- the Regional Plan: Water for Otago.

Summary understanding of the values which Māori place on the awa in this area

Fresh water holds particular cultural and spiritual value to tangata whenua, as sources of mahika kai, for their mauri and in some instances as wahi taoka. Consideration of activities from a cumulative perspective over the whole catchment is required to reflect the values of ki uta ki tai where land and water are connected from mountains to seas. The health and well-being of fresh water is linked to its cleanliness and contamination of the awa will diminish the mauri.

At a local level the Kimi-ākau/Shotover River and Kawarau River are recognised wāhi tupuna, in particular through their use as ara tawhito (traditional travel routes - especially as a route towards the West Coast/Tai Poutini for pounamu), mahika kai (food gathering) and by Māori miners.

Statement of cultural values associated with the short-term emergency discharge application to the Kimi-ākau/Shotover River

Ka Rūnaka (via Aukaha and Te Ao Marama) have provided a statement of cultural values associated with the short-term emergency discharge application to the Kimi-ākau/Shotover River, but this also has relevance to this application to discharge to the Kawarau River.

The Cultural Position Statement sets out mana whenua values in relation to wastewater discharge, emphasising that the direct discharge of treated human waste to natural water bodies is considered culturally unacceptable, regardless of the level of treatment. Within mātauranga Māori, water is classified according to its origin and use, and the mixing of different water types—particularly polluted water (wai-kino) with natural water—is regarded as inappropriate. Wastewater leaving a treatment plant is considered tapu, and therefore should not be discharged directly into surface water.

Instead, the statement strongly supports land-based treatment and discharge, where wastewater is filtered and transformed through natural processes before re-entering the wider environment. This interaction with Papatūānuku and natural elements such as vegetation, microorganisms, wind and sunlight is seen as essential to restoring the mauri of the water, transitioning it from tapu to noa. These processes not only improve water quality but also enhance biodiversity and ecological function, aligning wastewater management with cultural values and environmental regeneration.

Treaty settlement

Ngāi Tahu and the Crown signed a Deed of Settlement on 21 November 1997. The Ngāi Tahu Claims Settlement Act 1998 gives effect to the Deed of Settlement. The Ngāi Tahu

settlement includes,[23] among other things, an apology from the Crown[24] and cultural redress.[25]

The Crown apology recognised Ngāi Tahu as "the tāngata whenua of, and as holding rangatiratanga within, the Takiwā of Ngāi Tahu Whānui."[26]

The cultural redress includes statutory acknowledgement and nohoanga entitlements.

Recognition of mana

The Crown recognised Ngāi Tahu's mana in the Treaty settlement in various ways, including through statutory acknowledgements and place names.

A statutory acknowledgement is an acknowledgement by the Crown of Te Rūnanga o Ngāi Tahu's particular cultural, spiritual, historical, and traditional association with a site or area.[27] Statutory acknowledgements recognise the mana of Ngāi Tahu over a range of sites and areas in the takiwā and have implications for processes under the RMA and the Heritage New Zealand Pouhere Taonga Act.[28]

There are statutory acknowledgements for:

- Mata-au (Clutha River)[29];
- Te Wairere (Lake Dunstan)[30];
- Whakatipu-wai-māori (Lake Wakatipu)[31];

Deeds of recognition are between the Crown agency responsible for the management of a site or area subject to a statutory acknowledgment and Ngāi Tahu and provide for agreed input by Ngāi Tahu into management processes.[32] There are deeds of

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[23] The redress is summarised in section 2.3.1 of the Deed of Settlement.

[24] Ngāi Tahu Claims Settlement Act 1998, pt 1; Deed of Settlement, section 2.1.

[25] Ngāi Tahu Claims Settlement Act 1998, pts 11–13 and schs 9–110; Deed of Settlement, sections 11–13.

[26] Ngāi Tahu Claims Settlement Act 1998, s 6; Deed of Settlement, section 2.1.

[27] Ngāi Tahu Claims Settlement Act 1998, s 206.

[28] Ngāi Tahu Claims Settlement Act 1998, ss 207–211, 215 and 220; Deed of Settlement, section 12.2.

[29] Ngāi Tahu Claims Settlement Act 1998, sch 40; Deed of Settlement, attachment 12.24. The statutory acknowledgement does not include any tributary flowing into the river (see cl 5.4(d) of attachment 12.24 to the Deed of Settlement and the definition of 'river' in s 205 of the Ngāi Tahu Claims Settlement Act 1998).

[30] Ngāi Tahu Claims Settlement Act 1998, sch 61; Deed of Settlement, attachment 12.50. The statutory acknowledgement does not include any river draining into the lake (see cl 5.4(c) of attachment 12.50 to the Deed of Settlement and the definition of 'lake' in s 205 of the Ngāi Tahu Claims Settlement Act 1998).

[31] Ngāi Tahu Claims Settlement Act 1998, sch 75; Deed of Settlement, attachment 12.43. The statutory acknowledgement does not include any river draining out of the lake (see cl 5.4(c) of attachment 12.50 to the Deed of Settlement and the definition of 'lake' in s 205 of the Ngāi Tahu Claims Settlement Act 1998).

[32] Ngāi Tahu Claims Settlement Act 1998, ss 212–214 and 216; Deed of Settlement, section 12.3.

recognition for Mata-au (Clutha River),[33] Te Wairere (Lake Dunstan),[34] and Whakatipu-wai-māori (Lake Wakatipu).[35]

The settlement also amended the place name of various locations in the takiwā, including Mata-au (Clutha River).[36]

Nohoanga

The Treaty settlement provides nohoanga entitlements for the purpose of permitting members of Ngāi Tahu Whānui to temporarily occupy land close to the waterways on a non-commercial basis, so as to have access to the waterways for lawful fishing and gathering of other natural resources. The are two nohoanga along the Kimi-ākau/Shotover River, one upstream at Tucker Beach (above the SH6 bridge on the true right bank of the Kimi-ākau/Shotover River). Downstream, there are nohoanga sites on the Mata-au (Clutha River).[37]

Operative and Proposed District Plan

QLDC's Operative and Proposed District Plan GIS mapping tool does not show any recorded archaeological or cultural sites within or adjacent to the subject area.

Proposed Otago Regional Policy Statement

The RPS has been informed by various documents, including the two iwi management plans discussed below and Te Rūnanga o Ngāi Tahu Freshwater Policy 1999. Objectives and policies of the iwi management plans are reflected in the Resource Management Issues of Significance to Kāi Tahu and have been taken into account in the development of provisions across the whole of RPS.

During Kāi Tahu's involvement in the RPS, they promoted the ki uta ki tai approach (the foundation of the iwi management plans) and holistic management to protect mauri.[38] Further detail on the RPS, and its objectives and policies, is set out in section 7.2.5.

Regional Plan: Water for Otago

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[33] Deed of Settlement, attachments 12.88A and 12.88B.

[34] Deed of Settlement, attachment 12.114.

[35] Deed of Settlement, attachments 12.107A and 12.107B.

[36] Ngāi Tahu Claims Settlement Act 1998, ss 269–271 and sch 96; Deed of Settlement, section 12.8 and attachment 12.146.

[37] Ngāi Tahu Claims Settlement Act 1998, ss 255–268 and sch 95; Deed of Settlement, section 12.7 and attachment 12.145.

[38] See for example, kai-tahu-ki-otago-te-runanga-o-moeraki-kati-huirapa-runaka-ki-puketeraki-te-runanga-o-otakou-and-hokonui-runanga-fpi030-sandra-mcintyre.pdf and appeal-non-fpi-amended-3724-65-89.pdf

Chapter 4 of the Regional Plan: Water sets out the perspective of Kāi Tahu ki Otago on the wai, including that:

- the mauri or life force of water is sacred, a value that originates from the dawning of time, and is a link to the very source of tribal creation traditions;
- a water body with an intact mauri will sustain healthy ecosystems, support mahika kai, provide resource use options and be a source of pride and identity to the people; and
- the water resources of the Otago region provide mahika kai directly, provide ecosystem support for mahika kai species, and support other significant mahika kai environments, for example forest and coastal areas.

Chapter 4.13 sets out issues of concern to Kāi Tahu, including that the discharge of human waste to water bodies is an affront to Kāi Tahu. Chapter 4.13.5 states:

> *The discharge of untreated and treated human waste and other contaminants to water bodies is particularly offensive to Kāi Tahu, since water is of both spiritual and practical importance to the indigenous culture of Otago. Degradation of any water body undermines the enduring cultural relationship iwi have traditionally enjoyed and seek to retain with their waters. In addition, the custom of gathering food (mahika kai) from water bodies is jeopardised, since the practice of consuming food gathered from resources contaminated by, in particular, human wastes is abhorrent to iwi. Severance of the spiritual relationship with, and of the customary use of, a water body strikes at the very identity and well being of the indigenous culture. This causes a failure as kaitiaki to protect and pass on to the next generation an intact mahika kai custom.*

Further detail on the Regional Plan: Water is set out in section 7.2.6.

Iwi Management Plans of Kāi Tahu ki Otago and Ngāi Tahu ki Murihiku

The Kāi Tahu ki Otago Natural Resource Management Plan 2005 and Te Tangi a Tauira: Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 provide helpful guidance on cultural values in and around the Kawarau River. Ki Uta Ki Tai underlies both iwi management plans and is important for understanding the cultural effects of the project.

Kāi Tahu ki Otago Natural Resource Management Plan 2005

Chapter 1.2 sets out the plan philosophy as follows:

> *The kaupapa of this plan is "Ki Uta Ki Tai", "Mountains to the Sea" and reflects the Käi Tahu ki Otago philosophy to natural resource management. This philosophy is depicted in the taoka "Kaitiakitaka" on the cover of this Plan that encompasses the values and beliefs of manawhenua.*

The kaupapa "Ki Uta Ki Tai", emphasises holistic management of the interrelated elements within and between catchments, from the air and atmosphere to the land and the coastal environment, implementation will require a collaborative approach.

Chapter 1.5.1 sets out the shared interest with Papatipu Rūnaka in Murihiku.

Chapter 10 outlines the issues, and policies for the Clutha/Mata-au Catchments and includes a description of some of the Käi Tahu ki Otago values associated with the Clutha/Mata-au Catchments. One of the Wai Maori issues identified in the catchment was that "[e]xisting sewage schemes are not effectively treating the waste and do not have the capacity to cope with the expanding population".

Te Tangi a Tauira: Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008

Ki Uta Ki Tai is similarly the Kaupapa for Murihiku, as set out in chapter 1.2:

The kaupapa of this Plan is Ki Uta Ki Tai – From the Mountains to the Sea. It is a culturally based natural resource framework developed by and for Ngāi Tahu Whānui and has been identifi ed and advocated as a key tool in assisting Ngāi Tahu achieve more meaningful rangatiratanga and kaitiakitanga in natural resource management. It is about an indigenous understanding of the environment that can be used to help address the wide range of issues rūnanga face with regards to environmental management. Ki Uta Ki Tai is based on the idea that if the realms of Tāwhirimatea (god of the winds), Tāne Mahuta (god of all living things), Papatūānuku (mother earth) and Tangaroa (god of the sea) are sustained, then the people will be sustained. The kaupapa reflects the knowledge that resources are connected, from the mountains to the sea, and must be managed as such. Furthermore the kaupapa reflects that we belong to the environment and are only borrowing the resources from our generations that are yet to come. It is considered our duty to leave the environment in as good or even better condition than received from our tūpuna. The historical practices were established by our tūpuna and must be passed on to ngā uri kei te heke mai, the generations

Further detail on the iwi management plans is set out in section 7.3.1.

3.11Other water users

According to ORC's Consents in Otago GIS viewer the closest known consented surface water take from the Kawarau River downstream from the subject discharge is in Cromwell (more than 40 km downstream).

The closest registered drinking water supply downstream from the discharge is associated with Queenstown Bungy Limited (approx. 12 km downstream), noting that this supply appears is actually from a tributary of the Kawarau River, not the main stem.

It is acknowledged that there may be potable water abstractions from the Kawarau River that are permitted under the RPW, meaning there may be no record of their abstraction.

However, an interrogation of the ORC GIS bore and water permit layers would suggest that most downstream properties are supplied with drinking water through the QLDC community supply at Lakes Hayes, or, if not from smaller tributaries, then through permitted takes from individual bores located near to the Kawarau River (likely due to the elevation of land above the Kawarau River through the gorge and greater protection afforded to groundwater sources compared with surface water sources particularly during rain events). The closest of these bores is approximately 5km downstream.

3.12 Schedule 1 of the RPW

Schedule 1 of the RPW outlines the natural and human use values of various watercourses throughout the Otago region. Table 20 summarises the natural values identified in Schedule 1A that apply to the Kimi-ākau/Shotover and Kawarau Rivers.

Table 20: Natural values identified in the Schedule 1A of the RPW that apply to the Kimi-ākau/Shotover and Kawarau Rivers

Kawarau River	
Ecosystem Values	▪ Large water bodies supporting high numbers of particular species, or habitat variety, which can provide diverse life cycle requirements of particular species; ▪ Bed composition of importance for resident biota – gravel and rock; ▪ Absence of aquatic pests (e.g. Lagarosiphon) identified in the Pest Management Strategy for Otago 2009; ▪ Presence of indigenous fish threatened with extinction; ▪ Presence of eels, salmon & trout
Outstanding Natural Features	Outstanding: a) for its wild, scenic characteristics; b) natural characteristics, in particular the return flow in the upper section when the Kimi-ākau/Shotover River is in flood; c) for scientific values, in particular the return flow in the upper section when the Kimi-ākau/Shotover is in flood; d) for recreational purposes, in particular rafting, jet boating and kayaking. Spectacular and rugged river gorge, schistose landscape, fast flowing white water and rapids, old gold sluicing landscape, from confluence with Arrow River to Lake Dunstan.
Significant indigenous vegetation and	Significant habitat for kōaro including many tributaries.

significant habitat of indigenous fauna	
Kimi-ākau/Shotover River	
Ecosystem Values	▪ Bed composition of importance for resident biota – gravel, boulder, sand, rock; ▪ Large water bodies supporting high numbers of particular species, or habitat variety, which can provide diverse life cycle requirements of particular species; ▪ Absence of aquatic pests (e.g. Lagarosiphon) identified in the Pest Management Strategy for Otago 2009; ▪ Presence of riparian vegetation of significance to aquatic habitats; ▪ Presence of a significant range of indigenous waterfowl; ▪ Presence of indigenous waterfowl threatened with extinction.
Outstanding Natural Features	Outstanding: a) for its wild and scenic characteristics; b) for its natural characteristics, in particular the high natural sediment load and active delta at confluence with Kawarau River; c) scientific value, in particular the high natural sediment load and active delta at confluence with Kawarau River; d) for recreational purposes, in particular rafting, kayaking and jet boating; e) for historical purposes, in particular gold mining. Spectacular and rugged river gorge, schistose landscape, fast flowing white water and rapids, old gold sluicing landscape, in main stem between confluence with Iron Stone Stream and Arthur Point. Wild and scenic characteristics, from confluence with Iron Stone Stream to its source.
Significant indigenous vegetation and significant habitat of indigenous fauna	*Significant habitat*: Areas of importance to internationally uncommon species - black fronted tern, banded dotterel - in main stem between Arthurs Point and its source.
Areas with a high degree of naturalness	A high degree of naturalness above 900 metres asl.

Schedule 1B of the RPW identifies rivers where the water taken is used for public water supply purposes. There are no Schedule 1B values listed for the Kimi-ākau/Shotover or Kawarau Rivers.

Schedule 1C identifies registered historic places, with the following places listed for the subject rivers:

- Kawarau River: Kawarau Falls bridge and dam, Frankton, Queenstown; Kawarau Gorge Suspension Bridge, SH 6, Gibbston.
- Kimi-ākau/Shotover River: Oxenbridge Tunnel, Arthurs Point, Queenstown; Edith Cavell Bridge, Arthurs Point, Queenstown.

Schedule 1D identifies the spiritual and cultural beliefs, values and uses associated with water bodies of significance to Kāi Tahu. The Kimi-ākau/Shotover and Kawarau Rivers are identified as having the following:

Watercourse	Schedule 1D beliefs, values and uses
Kawarau River	▪ Kaitiakitanka: the exercise of guardianship by Kāi Tahu, including the ethic of stewardship ▪ Mauri: life force; ▪ Waahi taoka: treasured resource; values, sites and resources that are valued; ▪ Trails: sites and water bodies which formed part of traditional routes, including tauraka waka (landing place for canoes); ▪ Cultural materials: water bodies that are sources of traditional weaving materials (such as raupō and paru) and rokoā (medicines).
Kimi-ākau/Shotover River	▪ Kaitiakitaka: the exercise of guardianship by Kāi Tahu, including the ethic of stewardship; ▪ Mauri: life force; ▪ Waahi taoka: treasured resource; values, sites and resources that are valued; ▪ Mahika kai: places where food is procured or produced; ▪ Kōhaka: important nursery/spawning areas for native fisheries and/or breeding grounds for birds; ▪ Trails: sites and water bodies which formed part of traditional routes, including tauraka waka (landing place for canoes); ▪ Cultural materials: water bodies that are sources of traditional weaving materials (such as raupō and paru) and rokoā (medicines).

3.13 Sensitivity of the receiving environment

The Kawarau River is a sensitive receiving environment. The river at the point of discharge and further downstream is important to the community and culturally significant to local rūnaka who have strong links to the area and value the rivers for their mahika kai values. The Kawarau River is also important from an environmental perspective with excellent overall water quality, providing habitat for indigenous and sports fishery values.

Many of the tourism and commercial activities which operate in the area are dependent on the high values of the river environment. The Kawarau River and downstream rivers are highly valued by the community for recreational purposes, including contact recreation, and the particular ruggedness of the natural character, landscape and amenity values of the river environment.

A discharge of treated wastewater from the WWTP to this area has been occurring since 1970, with the discharge only moving from being direct to surface water to land (via the DAD) on the delta in 2019.

3.14 Reasonable mixing zone

The definition of "reasonable mixing" in the RPW is as follows:

> *"The process where undiluted effluent disperses through receiving waters. Mixing results in a mixing zone where the concentration of contaminants varies from that in the effluent to that of the fully mixed receiving water. Reasonable mixing may be said to have occurred at some point between the point of discharge and the point at which the effluent is completely mixed with the receiving water. Beyond the reasonable mixing zone, the effluent and water mix complies with any water quality standards for the water body. "*

Policy 7.B.6 then states that when considering a discharge application, the need for a zone of physical mixing (where the Schedule 15 standards will not be met) shall consider the following:

> *"(a) The sensitivity of the receiving environment; and*
>
> *(b) The natural and human use values, including Kāi Tahu values; and*
>
> *(c) The natural character of the water body; and*
>
> *(d) The amenity values supported by the water body; and*
>
> *(e) The physical processes acting on the area of discharge; and*
>
> *(f) The particular discharge, including contaminant type, concentration and volume; and*
>
> *(g) The provision of cost-effective community infrastructure; and*
>
> *(h) Good Quality Water as described in Schedule 15."*

The reasonable mixing zone on the Kawarau River for this application is at a point 800m downstream from the discharge, at the end of the confluence with the Kimi-ākau/Shotover River. The GHD WQ report provides further justification for this reach in section 5.3 of that report, which has been summarised here.

The RPW and RPS do not provide any further numerical description of how to define the extent of the reasonable mixing zone.

For the purpose of their assessment, the reasonable mixing zone extent has not been identified based on a nominal distance by GHD, but has been determined through consideration of the following:

(1) The point at which the effluent discharge is mixed with a reasonable percentage of river water. Consideration of this is suggested by Cook et al.(2010) as being preferable for rivers.

(2) The point prior to an identified commonly used public bathing location.

(3) The point after which compliance with various water quality standards is considered reasonable as a means of controlling potential adverse effects to water quality and the environment.

In respect of point (1), the Kawarau River reach across the Shotover Delta is straight with a well-formed channel. In such environments, natural dispersion is limited, and long mixing zones commonly occur. Any discharge near the true left riverbank is considered likely to remain in that general left area of the Kawarau River, until turbulence from changes in flow direction or other water inflows, results in more complete dispersion of the treated wastewater.

The proposed discharge structure and discharge location has been positioned close to the confluence with the Kimi-ākau/Shotover River to reduce potential adverse effects of the discharge. This positioning provides for (consistent with clauses (e), (f) and (h) of Policy 7.B.6):

- Maximising the extent of Kawarau riverbank that is unaffected by the proposed discharge;
- Makes best use of river turbulence at the confluence to disperse the treated wastewater; and
- Limits the potential length of Kawarau River riverbank that may be impacted by elevated contaminant concentrations.

Because of the active and changeable nature of the Kimi-ākau/Shotover River flows, the point at which the treated wastewater discharge mixes with the inflowing Kimi-ākau/Shotover River waters may therefore occur between approximately 100m of the discharge location to the end of the Shotover Delta, approximately 800 m downstream.

In reference to point (2), the location of the nearest public swimming area (the beach by the Twin Rivers Trail intersection immediately downstream of the River confluence) is identified in the Rec Report. GHD considered it appropriate that recreational water use criteria are achieved before this sensitive public bathing area.

And finally, GHD considered the reach of the Kawarau River downstream of the Shotover Delta, where the channel is more constrained and less dynamic, to be more sensitive to ecotoxicity effects and where maintenance of NPS-FM A Band attributes (for nitrate-N and ammoniacal-N) to be appropriate (Point (3)).

As well as considering the effects "after reasonable mixing" as directed by Sections 70 and 107 of the RMA (and, in relation to the WCO, Schedule 3 of the RMA), the technical assessments in all four expert reports also consider the effects close to and within 40m of the outfall ("Near-field mixing area") and those after "Complete mixing". Complete mixing is considered to be the state at which a discharge has fully mixed with the receiving environment, resulting in negligible spatial concentration gradients and effectively uniform concentrations across a cross-section. For this discharge GHD consider that point to be approximately 4km downstream of the discharge.

Evaluating effects within the near-field mixing area and within the reasonable mixing zone is consistent with the matters in clauses (a)- (d) of Policy 7.B.6 when considering the sensitivity of this environment, Kāi Tahu values, natural and human use values (particularly recreation), and natural character and amenity values of the wider Shotover delta and Kawarau River (especially in respect of identified outstanding values the WCO).

Clause (g) of Policy 7.6.B also requires consideration of the "*provision of cost-effective community infrastructure"* when determining a reasonable mixing zone. As outlined in the assessment of alternatives in section 1.2, alternative locations for the discharge have been considered. This proposal represents the cost-effective option available to QLDC at this point in time, with a long-term solution needing to be in place by December 2030. Dispersion modelling was undertaken by GHD to support the assessment of effects and led to the introduction of additional treatment (chemical dosing, tertiary filter and enhanced UV) in order to meet water quality limits within the "near-field mixing area" for public health and ecosystem toxicity and after the "reasonable mixing zone" for other water quality parameters, but still be cost-effective for the community.

In summary, the extent of the reasonable mixing zone for the proposed discharge to the Kawarau River has been identified through a site-specific, effects-based assessment that is consistent with the definition in the RPW and the matters in Policy 7.B.6. Rather than relying on a nominal distance, the 800 m mixing zone reflects the point at which treated wastewater is adequately dispersed, avoids sensitive recreational use areas, and enables compliance with relevant water quality standards. The proposed outfall location near the Kimi-ākau/Shotover River confluence appropriately utilises local

hydrodynamic conditions to enhance mixing while minimising the spatial extent of potential effects on river values, including amenity, natural character, and Kāi Tahu interests. This approach, together with the incorporation of advanced treatment to achieve compliance within the near-field and beyond the mixing zone, represents a balanced outcome that manages environmental effects while providing for cost-effective community infrastructure.

4. Activity Classification

An assessment of the proposal against the relevant statutory documents has been undertaken and the following reasons for consent have been identified. A detailed rule assessment is provided in Appendix N.

4.1 Riverbed definition

The riverbed definition and the question of defining the bed for this application was raised with ORC at the pre-application meeting on 5 April 2026. On 20 May 2026 ORC responded that it "is unable to be definitive as to the exact extent of the riverbed in this location."

Under the RMA (and RPW), the bed of a river is defined as 'the space of land which the waters of the river cover at its fullest flow without overtopping its banks'.

However, recent case law[39] indicates that the riverbed should be defined primarily by it's identified banks, with less emphasis on the river's 'fullest flow'.

As the Kawarau River bank along the true left in this location is relatively recent (owing to the construction of the training line in 2011), and flood flows are influenced by both the buffering effect of Lake Wakatipu and backwater effect from the Kimi-ākau/Shotover River, the bank is more difficult to define.

However, a recent decision from ORC on Consent RM25.123 to install groundwater investigation bores concluded that any area of the delta to the east and north of the training line is considered to be riverbed. While the proposed wastewater disposal infrastructure will be located on the western and southern side of the training line, and despite a lack of clarity on the technical basis for ORC's demarcation of the riverbed, a conservative approach would dictate assuming that at least most of the rock outfall structure, is located within the technical riverbed. In the GHD WQ Report, they reference a typical flood water level of 310 mRL. Through reference to drawing CI-00008 it can be inferred that this would be just below the existing surface level at the proposed outlet manhole location, consistent with the assumption that most of the outfall structure

[39] Canterbury Regional Council vs Dewhirst (2019) NZ Court of Appeals

would be considered to be located on the riverbed. Particularly with regards to the RPW, this is important for determining which land use rules may be applicable to the proposal.

4.2 Resource Management (National Environmental Standards for Freshwater) Regulations 2020

The Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NESF) came into effect on 3 September 2020 and applies to a range of activities that may impact freshwater.

A full assessment of the proposal against the relevant provisions of the NESF is provided in Appendix N. Based on that assessment, no consents are required under the NESF.

4.3 Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007

The National Environmental Standards for Sources of Human Drinking Water (NES-DW) include standards governing monitoring of water supplies and protection of abstraction points, water treatment plants and distribution networks.

A full assessment of the proposal against the relevant provisions of the NES-DW is provided in Appendix N. Based on that assessment, no consents are required under the NES-DW.

4.4 Resource Management (National Environmental Standards for Air Quality) Regulations 2004

The National Environmental Standards for Air Quality (NES-AQ) govern air quality via the imposition of five priority contaminants.

A full assessment of the proposal against the relevant provisions of the NES-AQ is provided in Appendix N. Based on that assessment, no consents are required under the NES-AQ.

4.5 Regional Plan: Water for Otago (1998)

The following consents are required under the RPW, as per the full assessment provided in Appendix N:

- The potential take of groundwater for dewatering associated with the discharge pipe installation more than 100 m from the river is a **restricted discretionary activity**.
- The discharge of human sewage to water, or onto or into land in circumstances where it may enter water, is a **discretionary activity**.
- The discharge of treated water or associated contaminants from industrial or trade premises from the WWTP is a **discretionary activity**.

- The placement of an outfall on or in the bed of the Kawarau River is a **discretionary activity**.
- The disturbance of the bed of the Kawarau River and any resulting discharge or deposition of bed material associated with the placement, repair or maintenance of the outfall (and possibly pipeline, depending on ORC's stance on riverbed delineation) is a **discretionary activity**.
- The excavation of bed material (alluvium) in relation to the outfall construction is a **restricted discretionary activity.**
- If Council considers that Rule 13.6.2.1 is not applicable to the activity, the planting of vegetation on the bed the Kawarau River is a **discretionary activity**.

4.6 Regional Plan: Air for Otago (1998)

The following consents are required under the Regional Plan: Air for Otago (RPA), as per the full assessment provided in Appendix N:

- The discharge of contaminants to air from liquid-borne municipal, industrial and trade waste from the WWTP and outfall discharge is a **discretionary activity**.

4.7 District Plan

4.7.1 Designation

The Shotover WWTP is subject to Designation #46 (QLDC Sewage Treatment Works) in the both the Operative and Proposed Queenstown Lakes District Plans (ODP and PDP, respectively) and has been designated for this purpose since around 1998. The relevant conditions of the designation are:

- All practicable measures shall be undertaken and maintained to minimise the risk of the site being inundated by water as a result of flooding that could cause pollution to enter the Kimi-ākau/Shotover and Kawarau Rivers. A risk management report on this issue shall be included with the Outline Plan referred to in Condition 10.
- Any upgrades or extensions to the facility shall ensure that public access to sport fishing and game-bird hunting venues in the vicinity is maintained.
- The Requiring Authority shall design, develop and manage the public work so that it does not attract any birds that are hazardous to aircraft or may endanger aircraft operations. The bird species that have been observed at the airport and which may be hazardous to aircraft are gull, oyster catcher, hawk, spur-wing plover and duck.
- 6 months prior to any work being carried out in accordance with an Outline Plan which increases access to water, monitoring of bird activity shall be undertaken by a suitably qualified person experienced in wildlife observation to determine a

baseline of bird activity. Subsequently, from the date any work is carried out in accordance with the Outline Plan, the site and surrounding area shall be monitored monthly by a suitable qualified person experienced in wildlife observation and approved by the Territorial Authority. This person will monitor bird activity in and around the site as an impartial observer to enable any increased bird activity as a result of the work to be identified.

- The result of all monitoring shall be reported to the Territorial Authority and the Queenstown Airport Corporation Limited every three months.
- In the event of any hazard to Queenstown Airport operations arising from birds which have been shown to have or likely to have been attracted to the area by any work for which Outline Plan approval has been obtained, the Territorial Authority reserves the right to review the conditions of consent attached to this designation for the purpose of mitigating, remedying or avoiding any adverse effect on airport operations, that is apparent from the works or from on-going monitoring.

The WWTP and treated wastewater discharge commences within but continues beyond that designation, as shown in the below figure.

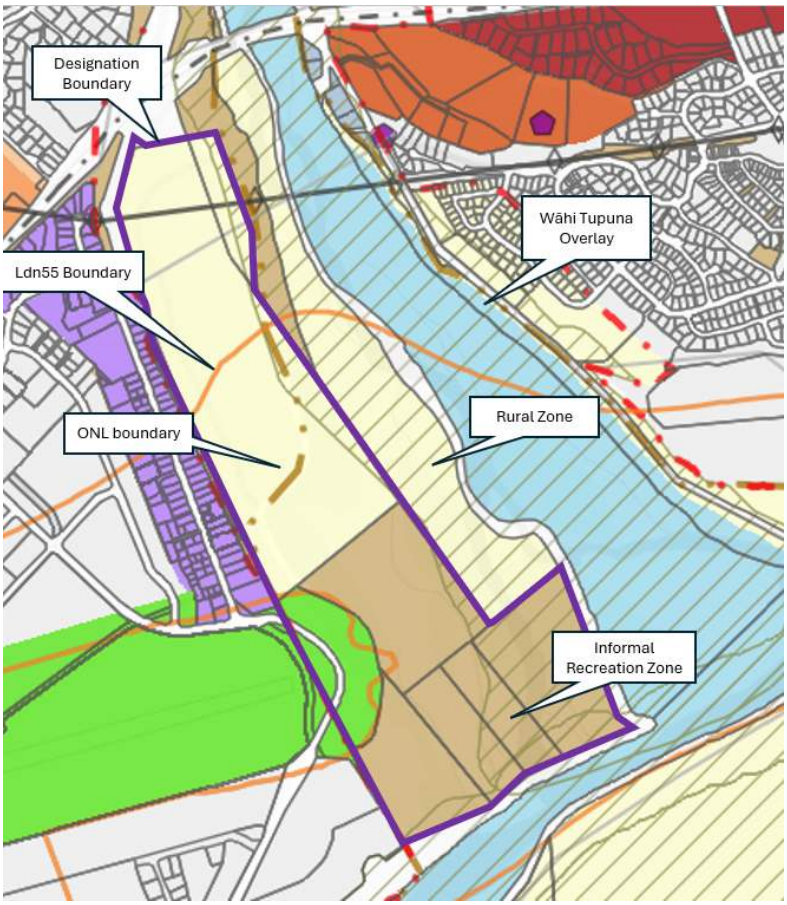

Figure 29: PDP zones, designations and overlays for the wider site

Section 176 of the RMA states:

(1) If a designation is included in a district plan, then—

(a) section 9(3) does not apply to a public work or project or work undertaken by a requiring authority under the designation;...

Section 9(3) prohibits the use of land in a manner that contravenes a district rule.

The works subject to this application (and associated ongoing works, such as pipeline maintenance or upgrades) are a public work being undertaken by the requiring authority (QLDC) within the scope of the designation. It is therefore considered that any such works within the designation area are exempt from the relevant rules of the district plans, while works beyond the designation are still subject to district plan rules and associated resource consent requirements.

4.7.2 Operative and Proposed District Plans

A full assessment of the activity against the relevant rules of the ODP and PDP is beyond the scope of this report, and will be addressed via separate application. However, based on the preliminary design for the wastewater pipeline and outfall, the following consenting requirements are likely:

- Resource consent to undertake earthworks that exceed the Rural Zone, Outstanding Natural Landscape (ONL) and Wāhi Tūpuna volume permitted thresholds; and
- Resource consent to undertake earthworks within 10 m of the bed of a water body.

4.8 ORC Flood Protection Management Bylaw

Clause 3.4.g. of the Flood Protection Management Bylaw (FPMB) requires the prior approval of ORC to carry out earthworks in, on or within 50 m of any training line. As such, approval will be sought from ORC for earthworks associated with the proposed wastewater pipeline in the vicinity of the training line. This will be sought under separate application.

4.9 Resource Consents Required – Summary

Resource consents required to authorise the proposal are summarised in the below table.

Activity	Status	Regional plan
Groundwater abstraction	Restricted discretionary	RPW
Human sewage discharge to water	Discretionary	

Industrial/trade waste discharge to water	Discretionary	
Outfall placement on river bed	Discretionary	
Riverbed disturbance and associated discharge of bed material from placement and maintenance of a structure	Discretionary	
Excavation of alluvium for outfall construction	Restricted discretionary	
Discharge of contaminants to air from municipal, industrial and trade liquid waste	Discretionary	RPA

Applying the bundling principle, the overall activity status for the proposal is a **discretionary activity**.

5. Assessment of Environmental Effects

The actual and potential effects of the proposal are assessed below and in the supporting technical assessments.

While the application requires resource consent as an overall discretionary activity, the matters of discretion that apply under the relevant rules have been used to guide the assessment of effects that relate to the proposal.

5.1 Effects Summary

The below table provides a summary of anticipated effects associated with the proposed long-term discharge of treated wastewater to the Kawarau River, temporary works associated with establishing the proposed discharge infrastructure, and discharges to air from the WWTP and associated outfall. All assessed effects provided in the below table reflect implementation of recommendation mitigation.

Table 21: Summary of anticipated environmental effects

Technical assessment	Activity	Attribute / effect type	Assessment
Surface Water and	Discharge of treated	Groundwater	Negligible adverse effect on downgradient groundwater.

Technical assessment	Activity	Attribute / effect type	Assessment
Groundwater Assessment (GHD)	wastewater to the Kawarau River	Hydrology	Less than minor adverse effects on hydrology.
		Water quality	Less than minor adverse effects on water quality after reasonable mixing. No more than minor adverse effects on water quality after complete mixing during low flow conditions. Overall, no more than minor adverse effects on water quality. No more than minor cumulative effects on water quality after complete mixing, including on the water quality of Lake Dunstan.
		Public health	Water quality will remain suitable for bathing downstream of the discharge structure and at the primary contact site identified. The requirements of the WCO in regard to water quality suitable for contact recreation are assessed as being met. Overall, adverse effects on public health are assessed as being less than minor.
Shotover WWTP	Discharge of treated	Avifauna	No effect on avifauna due to changes in water quality.

Technical assessment	Activity	Attribute / effect type	Assessment
Ecological Impact Assessment (Boffa Miskell)	wastewater to the Kawarau River	Kawarau River physical habitat modification (including outfall maintenance)	Less than minor[40] adverse effects.
		Changes in water quality and impact on the Kawarau River ecosystem	Less than minor adverse effects on the Kawarau River aquatic ecosystem due to changes in physical chemistry, nutrients, metals and other contaminants, and suspended solids.
		Changes in water quantity	Less than minor adverse effects on the Kawarau River ecosystem due to changes in water quantity.
	Pipeline and outfall construction (temporary effects)	Terrestrial vegetation and habitats	Less than minor adverse effects on terrestrial vegetation and habitats due to: • Vegetation clearance • Habitat fragmentation • Weed introduction and/or spread
		Avifauna	Less than minor adverse effects on avifauna due to: • Habitat loss and modification

[40]As part of this summary of effects, a technical assessment of 'negligible' or 'very low' effect has been correlated to a 'less than minor' effect under RMA terminology. Where a technical assessment determines a 'low' effect, this has been treated as 'no more than minor' in this AEE, while anything above 'low' (such as 'moderate', for example) has been treated as a 'more than minor' effect.

Technical assessment	Activity	Attribute / effect type	Assessment
			• Disturbance and displacement • Impacts on nesting birds
		Kawarau River ecosystem	Less than minor adverse effects on Kawarau River aquatic ecology due to: • Bed and bank disturbance • Fish injury or mortality • Sedimentation • Aquatic weed spread
Shotover Wastewater Treatment Plant Recreation Assessment (Thrive Spaces and Places)	Discharge of treated wastewater to the Kawarau River	Human health risk (recreation)	Less than minor adverse effects on human health for all recreation activities assessed, beyond the near-field mixing area. No more than minor adverse effects on human health for recreation activities within the near-field mixing area.
		Odour effects (recreation)	Negligible adverse effects on recreation from potential odour at the outfall.
		Angling	Negligible adverse effect on commercial angling. No more than minor adverse effect on non-commercial angling and angling-related fish health (noting that this is limited to the near-field mixing area, with lesser effects at a broader scale)
		Jet boating, rafting,	Negligible adverse effects on jet boating and water sports.

Technical assessment	Activity	Attribute / effect type	Assessment
		kayaking, river boarding	
		Terrestrial recreation	Negligible adverse effects on four wheel driving, motoX, mountain biking, general trail use, and other terrestrial recreation.
		Recreation access	No more than minor adverse effects on recreation access due to ongoing operation of the Kawarau River discharge.
	Pipeline and outfall construction (temporary effects)	Recreation access	No more than minor adverse effects on recreation access during the pipeline and outfall construction.
Shotover WWTP Landscape and Natural Character Effects Assessment (Boffa Miskell)	Discharge of treated wastewater to the Kawarau River	Natural character	Less than minor adverse effects on natural character at the reach scale.
		Landscape effects	No more than minor adverse effects on landscape.
		Cumulative landscape effects	Less than minor adverse cumulative effects on landscape values.
		Visual effects	No more than minor adverse visual effects.
	Pipeline and outfall construction (temporary effects)	Natural character effects	No more than minor adverse effects on natural character.
		Landscape effects	More than minor adverse effects on landscape due to construction

Technical assessment	Activity	Attribute / effect type	Assessment
			activities (limited to within 100 m of the outfall).
		Visual effects	More than minor adverse visual effects due to construction activities (limited to within 100 m of the outfall).
Cultural effects assessment (Landpro)	Discharge of treated wastewater to the Kawarau River	Effects on cultural values	More than minor and likely to be significant adverse effects on cultural values.
Shotover WWTP Odour Effects Assessment (Air Quality Consulting NZ)	WWTP operation	Odour effects from WWTP operation	Less than minor adverse effects due to odour from the upgraded WWTP.
	Outfall operation	Odour effects from the proposed Kawarau River outfall operation	Less than minor adverse effects due to odour from the proposed outfall discharge.
	WWTP and outfall	Cumulative odour effects	No more than minor cumulative adverse effects from concurrent operation of the WWTP and outfall.
Alluvium extraction assessment (Landpro)	Alluvium extraction associated with the construction of the effluent discharge pipeline and outfall	Matters for discretion listed under Rule 13.5.2.1	Overall, no more than minor adverse effects on the listed matters for council discretion.

5.2 Permitted Baseline

The "permitted baseline" is relevant to the assessments under sections 95A to 95G and 104 of the Act. Under these sections, the consent authority may disregard an adverse effect on the environment (or on a person, in the case of section 95E) if a national environmental standard or plan permits an activity with that effect. This is the permitted baseline. It is only the adverse effects over and above those forming a part of the baseline that are relevant when considering an application.

In this case, the permitted baseline relevant to this application is comprised of the following activities being permitted and relevant to the proposal.

5.2.1 Placement and presence of pipelines on/in the riverbed (RPW Rule 13.2.1.2)

The assessment in Appendix B concludes that the placement of pipes on the bed of a river is a **permitted activity**, provided flow is not impeded and the infrastructure is maintained.

For this proposal:

- the outfall and/or pipe will be located on or within the riverbed; and
- these structures are not expected to impede flow (pending further detailed design) or cause flooding, erosion or sedimentation.

Permitted baseline effect:

- The presence and operation of pipe infrastructure on or within the riverbed, including minor associated physical effects (e.g. localised disturbance or occupation of space), can form part of the permitted baseline.

5.2.2 Maintenance or repair of structures in the riverbed (RPW Rule 13.3.1.1)

Appendix B confirms that the repair and maintenance of lawful structures in the bed of a river is a **permitted activity**, provided there is no permanent change to scale or function.

Permitted baseline effect:

Ongoing maintenance activities, including minor disturbance of bed material and operational upkeep of infrastructure, may be treated as part of the baseline.

5.2.3 Disturbance of riverbed for maintenance (RPW Rules 13.5.1.2 and 13.5.1.3)

Appendix B confirms that minor disturbance of the riverbed associated with maintenance activities (e.g. removal of debris, reinstatement works) can be permitted, provided:

- duration and scale thresholds are met, and

- sediment effects are appropriately controlled.

Permitted baseline effect:

Short-duration, small-scale disturbance of bed material associated with maintenance works form part of the permitted baseline.

5.2.4 Certain groundwater takes associated with construction (RPW Rule 12.2.2.4)

Appendix B confirms that groundwater takes within 100 m of the Kawarau River for activities such as dewatering may be permitted, subject to limits on abstraction rate, and effects on other takes and water bodies.

Permitted baseline effect:

Limited dewatering effects associated with construction activities (where within permitted thresholds). In particular:

- No adverse effects on existing lawful water takes;
- <25 m^3/day for dewatering >100 m from the river; and
- <100 l/s and <1,000 m^3/day <100 m from the river.

5.2.5 Planting for erosion control and mitigation (RPW Rule 13.6.2.1)

Appendix B states that vegetation planting in the riverbed for erosion control or mitigation is a permitted activity, provided:

- pest species are avoided, and
- sediment effects are appropriately managed.

Permitted baseline effect:

The vegetation establishment (which will not include any pest species) and associated minor sediment disturbance in conjunction with the proposed ESCP form part of the permitted baseline.

5.2.6 Temporary construction-related discharges to air (RPA Rule 16.3.13.1)

Appendix B confirms that dust and minor air discharges from construction activities are permitted where they are not objectionable beyond the boundary.

Permitted baseline effect:

The temporary dust and construction-related emissions are not expected to be objectionable beyond the boundary and therefore form part of the permitted baseline.

5.3 Positive effects

The Shotover WWTP provides a significant utility service as part of QLDC's Three Waters functions. The WWTP currently services a population of 50,000 people and before further

upgrades are required, has capacity for up to 70,000 within the Whakatipu Basin communities of Queenstown, Arthurs Point, Frankton, Kelvin Heights, Quail Rise, Shotover Country, Lake Hayes Estate, Lake Hayes, Arrowtown, Jacks Point Village, Hanley's Farm and Ladies Mile.

5.3.1 Benefits of ongoing upgrades

The proposed WWTP upgrades, will result in a clear improvement in overall treatment performance and wastewater quality, generating positive environmental effects in the receiving environment. The introduction of tertiary filtration will significantly enhance the removal of fine suspended solids, resulting in improved wastewater clarity and reduced transport of particulate-bound contaminants. This will in turn support more effective downstream treatment processes, particularly UV disinfection, and reduce the risk of sediment-related effects such as deposition and habitat degradation.

Supplementary chemical dosing will provide enhanced removal of phosphorus, particularly in its dissolved and bioavailable forms. This will reduce the potential for nutrient enrichment in the receiving environment, lowering the risk of eutrophication and excessive algal growth, and supporting the maintenance of ecological health. In combination with this, enhanced UV disinfection will improve pathogen removal, including provision for higher levels of virus inactivation, thereby reducing risks to human health and improving the safety of recreational and downstream water uses.

Finally, with the recent decommissioning of all oxidation ponds at the WWTP in favour of more efficient wastewater treatment infrastructure, a significant source of potential odour has been removed from the system. This further frees up valuable space within the existing WWTP footprint for future expansion in line with projected population increases beyond 2060, and has enabled the commissioning of contingency storage that significantly reduces environmental and operational risk.

Taken together, these upgrades represent an integrated improvement to the treatment process, delivering a further step-change (after the Stage 3 upgrades) in wastewater quality and increasing the reliability and resilience of the WWTP. This will reduce the likelihood and magnitude of adverse effects associated with the discharge and provide greater confidence that environmental effects associated with the treatment of wastewater and disposal of treated wastewater can be appropriately avoided, remedied, or mitigated over the long term.

5.3.2 Benefits of the proposed long-term disposal solution

The proposed long-term disposal solution (piping highly-treated wastewater to the Kawarau River via a conveyance pipeline and outfall) will result in a number of positive environmental and operational effects, primarily arising from the characteristics of the receiving environment and the ability of the system to provide a reliable, long-term disposal pathway.

Municipal wastewater treatment plants are critical lifeline utilities that protect public health and environmental quality by ensuring the safe collection, treatment, and disposal of community wastewater. By centralising treatment and managing contaminants in a controlled manner, they reduce the risk of disease transmission, safeguard water bodies, and enable communities to function safely and sustainably while supporting their social, economic, and cultural wellbeing.

Another key positive effect of the proposed long-term solution relates to the assimilative capacity of the Kawarau River, which is characterised by high flows and a high-energy environment. The 2026 Council Report[41] indicates that the discharge will represent less than 0.5% of total river flows even under peak wastewater inflows, enabling rapid dilution and dispersion of treated wastewater. This dilution capacity, combined with the already high standard of treatment achieved at the WWTP, means that effects on water quality, ecological values and public health are expected to be no more than minor beyond the reasonable mixing zone (and within the near-field mixing area will not cause acute toxicity effects on aquatic organisms nor public health effects). In addition, the river's physical characteristics - such as frequent flushing flows and naturally high sediment loads downstream from the Kimi-ākau/Shotover River confluence - are considered to limit the potential for periphyton growth, further supporting the maintenance of ecological health.

The proposed disposal solution also provides significant system-level and environmental benefits compared to the existing consented system, particularly by enabling the transition away from the failed land-based disposal system and the current emergency discharge to the Kimi-ākau/Shotover River. The option will provide a secure, reliable long-term disposal pathway that can accommodate projected growth through to 2060. The simplicity of the pipeline and outfall system reduces operational risk and improves reliability, while also avoiding the large-scale land disturbance, groundwater risks and uncertainty associated with alternative land-based options.

Overall, the Kawarau River discharge solution represents a robust and adaptable long-term baseline solution, delivering positive effects through effective dilution and improved environmental outcomes relative to both the current consented DAD discharge and the short-term emergency discharge, along with increased certainty in wastewater management for the Whakatipu Basin. It also maintains flexibility for future upgrades or alternative disposal pathways, ensuring that environmental performance can continue to improve over time as technology and regulatory expectations evolve.

5.3.3 Affordability and cost-effectiveness

The proposed Kawarau River outfall provides a cost-effective and financially sustainable solution for managing wastewater at the scale required for the Queenstown community.

[41] QLDC (2026): *Shotover Wastewater Treatment Plan (SWWTP) Disposal Solution – Report for Agenda Item*

The assessment of alternatives (section 1.2) confirms that fully land-based or higher-order treatment options involve significantly greater capital, operational, and logistical costs and are not reasonably practicable, whereas the proposed discharge approach leverages a high level of treatment alongside the river's assimilative capacity and hydraulic mixing to achieve environmental outcomes efficiently. This enables QLDC to meet regulatory requirements and provide reliable wastewater services over the long term while minimising whole-of-life costs to the community in accordance with the requirement to deliver cost-effective infrastructure.

5.4Proposed discharge to the Kawarau River

The below sections provide an assessment of environmental effects for the proposed long-term discharge and associated infrastructure. Environmental effects associated with temporary works to construct and maintain the discharge infrastructure are assessed in Section 5.6.

5.4.1 Effects on Groundwater

5.4.1.1 Groundwater level and flows

Existing environment

Discharge Permit 2008.238.V2 authorises the discharge of treated wastewater to land via the DAD disposal system. Key thresholds relevant to hydrogeology under the consent are summarised below:

- Maximum volume of wastewater discharged to land: 45,000 m^3/day
- Maximum averaged discharge loading rate: 1,330 mm/day over total disposal field

The consented disposal mechanism inherently introduces a large, continuous volume of treated wastewater into the shallow delta aquifer, and the consent anticipates groundwater elevation effects by requiring installation and operation of at least seven piezometers and dataloggers to monitor groundwater levels, alongside additional requirements to monitor and report groundwater mounding.

The consent also expressly controls surface expressions of elevated groundwater (e.g., requiring that no ponding or surface run-off of treated wastewater occurs, and setting explicit constraints on mounding above ground surface and associated notification/review provisions).

The GHD WQ report (Appendix A) describes how the operation of the DAD in practice resulted in elevated wastewater levels and steep hydraulic gradients, with the piezometric surface exceeding ground level in places, particularly during periods of high river/groundwater levels. It notes that groundwater levels between the DAD and Kawarau River were typically either within 0.5 m of the ground surface or above ground surface for extended periods during spring, and that uneven topography combined with high

groundwater levels resulted in groundwater daylighting at surface in channels/depressions for extended periods.

Overall, while Discharge Permit 2008.238.V2 is not currently being implemented as intended (due to performance issues with the DAD disposal system), there are residual effects on groundwater that have been directly correlated to the exercise of that consent as it was intended. These effects form part of the existing environment.

Proposed long-term disposal solution

The proposed long term disposal solution effectively involves discharge to surface water, as an alternative to the currently-consented (failed) land-based disposal system.

The GHD report states that adverse effects on groundwater resources due to the proposal are negligible, noting that there are improvements to shallow groundwater quality already occurring due to cessation of discharge to land.

The report also describes the hydrogeologic setting that underpins this conclusion: the Shotover Alluvial Ribbon Aquifer is shallow and strongly connected to the adjacent rivers, with groundwater generally flowing toward the Kawarau River (discharging as seeps), and groundwater levels strongly correlated with river flow and seasonal conditions. In this context, removing the land-disposal input eliminates the major driver of local mounding associated with the DAD operating regime.

Overall, relative to the existing environment (including residual groundwater effects arising from Discharge Permit 2008.238.V2 that are still occurring), the proposal is expected to result in a reduction in ongoing groundwater level/flow effects, because the disposal mechanism no longer relies on infiltrating treated wastewater into the shallow delta aquifer. Any remaining groundwater-level variability is primarily controlled by the natural fluvially-influenced groundwater regime described in the technical report (seasonality and river flow correlation), rather than wastewater loading to land.

5.4.1.2 Groundwater quality

Existing environment

Currently, Discharge Permit 2008.238.V2 authorises the discharge of wastewater to land via the DAD disposal system, with subsequent consent requirements for routine groundwater quality monitoring (upgradient and downgradient bores, sampled twice yearly). Monitoring includes key wastewater indicators such as BOD_5, nitrogen species, phosphorus species, and microbial indicators (faecal coliforms). This monitoring framework reflects that effects on groundwater quality are possible under Discharge Permit 2008.238.V2.

The GHD technical report documents that the DAD operation introduced a “significant volume” of wastewater into the shallow delta aquifer and resulted in groundwater quality effects that were spatially widespread. It reports that during DAD compliance monitoring, very high ammoniacal-N concentrations were recorded in downgradient piezometers

(e.g., up to 156 g/m³ in a downgradient piezometer in 2024), and notes that in at least one location, ammoniacal-N concentrations in shallow groundwater were effectively similar to treated wastewater concentrations, indicating negligible in-ground attenuation in that part of the shallow aquifer.

Overall, under the current discharge permit authorisations, wastewater contaminants have a direct pathway to groundwater, and the monitoring evidence summarised in the technical report demonstrates that there are residual adverse effects on groundwater quality across the delta, with the highest concentrations typically occurring downgradient of the DAD.

Proposed long-term disposal solution

The technical report states that groundwater quality is already improving following cessation of discharge to land, and that this improvement is expected to continue over time because no further discharge to land (and hence groundwater) is proposed. Specifically, the report notes that groundwater monitoring since April 2025 (commencing shortly after cessation of discharges to the DAD field) shows a general pattern of reductions in ammoniacal-N concentrations over the past year in most monitoring wells, with concentrations decreasing by half or more in many locations. It also reports a decrease in nutrient concentrations along the Kawarau River frontage between March 2025 and March 2026, interpreted as being consistent with groundwater improvements following cessation of DAD discharges.

For the proposed discharge to the Kawarau River, the GHD WQ report concludes that:

Discharge of treated wastewater to the Kawarau River is not expected to result in effects to the shallow groundwater in the vicinity of the Shotover Delta, beyond the improvements which are otherwise experienced with ceasing wastewater discharge to ground and groundwater.

The report also addresses wider/downgradient groundwater resources, stating that effects on wider groundwater systems (including examples such as toward Lake Dunstan/Te Wairere (over 40km downstream) are expected to be negligible, due to the limited potential for meaningful changes in downstream surface water quality (which constrains any indirect groundwater implications).

Overall, in the context of the existing environment, the proposed long-term disposal solution is expected to have negligible adverse effects on groundwater quality, and — because it removes discharge to land as the key disposal mechanism (and therefore will not have the groundwater quality effects experienced under Discharge Permit 2008.238.V2) — is expected to support the continuation of the improving groundwater quality trend already observed since cessation of the DAD discharge.

Effects on groundwater summary

Based on the above assessments, and the technical report provided in Appendix A, adverse effects on groundwater due to the proposal are expected to be less than minor.

5.4.2 Effects on Surface Water Quality

A detailed assessment of the background water quality and predicted effects on water quality from the proposed discharge is provided in the GHD WQ report in Appendix A.

5.4.2.1 Existing environment

Discharge Permit 2008.238.V2 authorises the discharge to land, not directly to surface water. However, from an effects perspective, the pathway to surface water is:

1. Infiltration of wastewater into the shallow Shotover Delta aquifer;
2. Groundwater flow toward the Kawarau River; and
3. Discharge of contaminated groundwater to the river via seepage/springs.

This pathway is explicitly recognised in the technical report, which identifies groundwater seepage to the Kawarau River as a key mechanism by which historic discharges continue to influence surface water quality.

The GHD report provides empirical evidence of such effects, including:

- elevated nutrients in surface water along the Kawarau River frontage (relative to upstream sample location RS14 – see below figure), attributed to groundwater seepage from the delta;
- spatial pattern of highest surface water nutrient concentrations aligned with groundwater flow paths directly downgradient of the DAD; and
- increases in nutrient concentrations as the Kawarau River flows past the Shotover Delta.

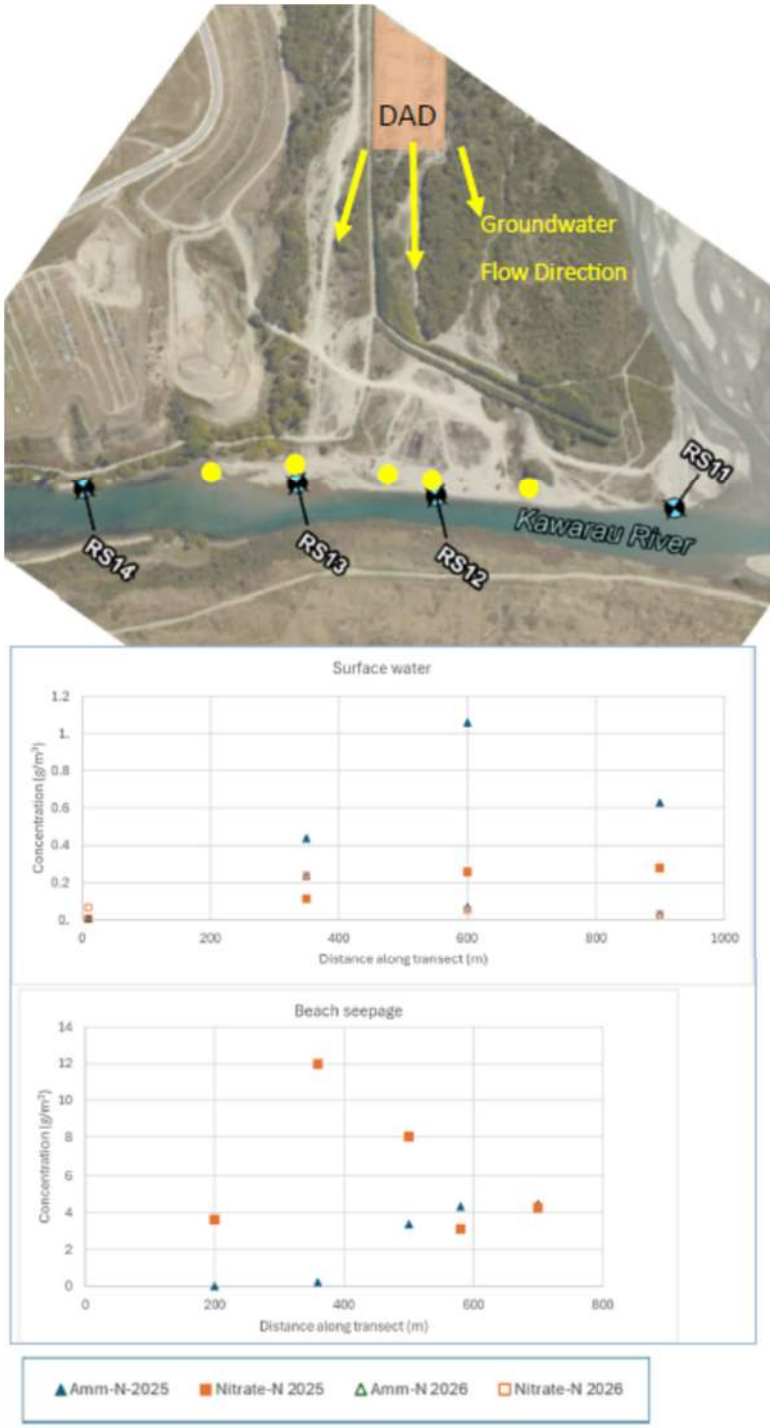

Figure 30: Water quality results from sample points on the true left of the Kawarau River - March 2025 and March 2026 (GHD, 2026)

Overall, the data collected indicates that nutrient concentrations in surface water reduced between March 2025 and March 2026. This is primarily attributed to cessation of treated wastewater discharges to the DAD field.

5.4.2.2 Proposed long-term disposal solution

Overview

The proposed discharge to the Kawarau River represents a fundamental shift in both the mechanism and expression of surface water quality effects, replacing a diffuse, groundwater-mediated pathway with a controlled point-source discharge subject to rapid hydraulic mixing. The GHD assessment provides detailed empirical and modelling evidence demonstrating how this altered pathway influences water quality outcomes at multiple spatial scales (near-field, reasonable mixing zone, and complete mixing conditions).

However, a comparison of known surface water quality effects from the DAD discharge with the expected water quality effects from the proposed discharge to water must be assessed in the context of substantial improvements in treated wastewater quality achieved through recent WWTP upgrades, and with further treatment enhancements that are committed to as part of the long-term consent strategy. These upgrades materially reduce the magnitude of effects associated with the point-source discharge, and are directly relevant to an assessment of the effects of the proposal against the existing environment.

Assessment

Following cessation of the DAD discharge and completion of the Stage 3 upgrades in late 2025, the WWTP has been operating without the use of oxidation ponds. The removal of oxidation ponds represents a key step change in treatment performance, as these ponds historically contributed to higher concentrations of ammoniacal-N, suspended solids, and organic matter in the final wastewater. The report notes a sharp reduction in ammoniacal-N concentrations from September 2025 onwards following these upgrades, with treated wastewater concentrations now substantially lower than those recorded historically (see below figure).

Table 8 and

Table 9 (Section 2.5.3) of this report compare treated wastewater quality from pre-Stage 3 upgrades (Nov 2023-Oct 2025) with post-Stage 3 upgrades (Nov 2025-April 2026). The comparison highlights significant improvements in the average concentration of all parameters, other than total phosphorus.

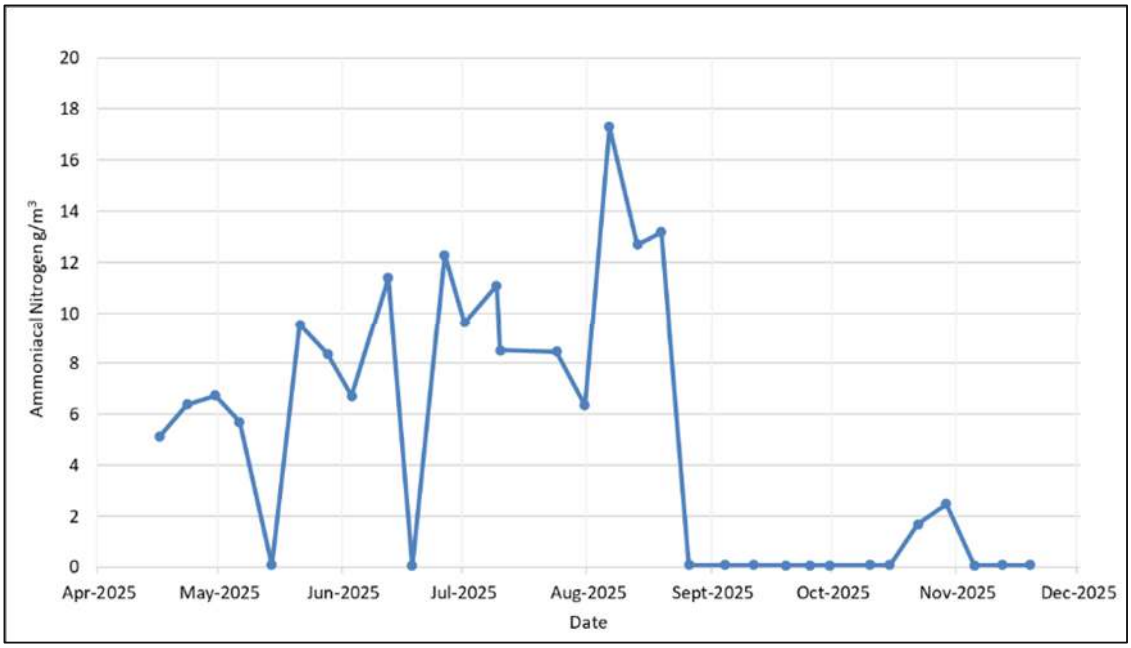

Figure 31: Ammoniacal-N in wastewater prior to discharge (GHD, 2026)

In addition to these already realised improvements, the proposed long-term discharge is explicitly linked to further staged treatment enhancements, which are incorporated into the effects assessment. These include:

- Tertiary filtration, targeting total suspended solids concentrations of 5 mg/L (median) and 10 mg/L (95th percentile), removing fine particulate matter and solids-bound contaminants;
- Supplementary chemical dosing (alum/PACL) to significantly reduce dissolved reactive phosphorus; and
- Enhanced UV disinfection, designed for higher capacity and greater biological treatment efficiency.

These upgrades are predicted to deliver further improvements in wastewater quality beyond what is already occurring at the WWTP. In particular, tertiary filtration and chemical dosing are expected to substantially reduce phosphorus concentrations, a key parameter controlling potential periphyton growth in the receiving environment. The report identifies that phosphorus loads under the proposed regime will be many times lower than those discharged historically, and significantly lower than those associated

with both the DAD discharge and current interim discharge to the Kimi-ākau/Shotover River.

When these improvements are considered in combination with the mixing regime of the Kawarau River, they materially reduce the predicted magnitude of surface water effects. The hydrodynamic modelling presented in the GHD report (Appendix A) demonstrates that the discharge is rapidly diluted, with contaminant concentrations reduced to approximately 2% of wastewater levels by the downstream end of the Shotover confluence (at transect CX5 in Figure 32, below). The fact that this dilution is applied to wastewater that has already undergone advanced biological treatment - and will be further polished through tertiary filtration and chemical dosing - means that absolute concentrations in the receiving environment are expected to be very low.

Figure 32: Kawarau River surveyed transect locations, as indicated by yellow lines with cross-sections numbered. Longitudinal profile indicated between cross-sections CX1 and CX2 (ESNZ, 2026)

The incremental improvement in wastewater quality also has a direct bearing on cumulative effects relative to the existing environment. Currently, surface water quality is influenced by groundwater seepage derived from historically higher-strength wastewater discharged to land. The GHD report shows that this groundwater pathway is already improving following cessation of DAD discharge, with measurable reductions in nutrient concentrations along the Kawarau River frontage over the past year. As the treated wastewater quality improves further under the proposed upgrades, any future discharge will be of substantially higher quality than what has entered the receiving environment via groundwater from the DAD (and which continues to adversely affect surface water quality following DAD cessation), reinforcing the trajectory of improving surface water conditions.

The below tables compare treated wastewater sample results between pre-stage 3 WWTP upgrades and post-stage 3 upgrades. As can be seen, there are significant improvements in treated wastewater following the stage 3 upgrades for all parameters measured. These improvements, in conjunction with further treated wastewater quality improvements that will result from upgrades to the WWTP to be implemented prior to initiating the Kawarau River discharge, strongly indicate that there will be significant enhancements in receiving surface water quality when compared to the existing environment.

Table 22: Plant discharge sampling data (Eurofins sampling only) prior to stage 3 upgrades (Nov 2023 – October 2025) (Source: GHD, 2026)

	TSS	cBOD5	TAN	TN	TP	E.coli	Nitrate (as N)
Average	14.3	13.6	8.9	16.2	2.7	548	8.2
Median	12	13.2	9.6	16.8	2.4	10	1.6
90%ile	27.5	22.2	13.2	23.8	4.5	130	21.4
95%ile	38.9	23.3	17.6	27.5	4.9	1098	28
Count	63	67	73	70	60	31	5

Table 23: Plant discharge sampling data (Eurofins sampling only) following stage 3 upgrades (Nov 2025 – April 2026) (Source: GHD, 2026)

	TSS	cBOD5	TAN	TN	DRP	TP	E.coli	Nitrate (as N)
Average	5.9	2.6	0.2	5.4	2.2	2.8	19	3.6
Median	5	2.3	0.1	5.2	2	2.6	12	3.4
90%tile	11.5	3	0.4	7.2	3.3	3.7	47	4.7
95%tile	16.2	4.6	2	8.7	3.7	4	100	4.9
Count	34	28	28	28	21	28	29	26

Following complete mixing, the mass balance assessment indicates that even under conservative assumptions (peak dry weather discharge and Kawarau River at MALF), predicted downstream concentrations remain within NPS-FM Attribute Band A criteria and relevant RPW Schedule 15 guideline values for all assessed parameters. This outcome reflects both the high assimilative capacity of the Kawarau River and the

material reduction in contaminant concentrations achieved through treatment upgrades.

Overall, the evidence demonstrates that the proposed point-source discharge is not only subject to strong hydraulic dilution but is also underpinned by substantially improved and progressively improving wastewater quality. Compared to the existing environment, in which indirect surface water discharge (via the DAD) of comparatively higher-strength treated wastewater via residual groundwater discharges is authorised, the proposed activity results in:

- Direct discharge of a significantly higher quality wastewater,
- Elimination of the delayed and diffuse groundwater pathway, and
- Predictable and rapid dilution within the receiving environment.

Effects on surface water quality summary

On the above basis, when treatment upgrades are considered alongside the mixing regime, the proposed discharge results in surface water effects that are no more than minor after reasonable mixing, and negligible after complete mixing. Furthermore, modelled contaminant concentrations beyond complete mixing fall within NPS-FM Attribute Band A criteria and relevant RPW Schedule 15 guideline values for all assessed parameters. The technical report states that the Stage 3 WWTP upgrades are '…expected to result in a net improvement to Kawarau River water quality.'

5.4.3 Effects on Hydrology

The proposed outfall, pipeline installation works, and treated wastewater discharge have been assessed for their potential effects on the hydrology of the Kawarau River and, to a lesser extent, the Kimi-ākau/Shotover River.

Based on the preliminary design, the outfall structure is expected to extend approximately 10 m into the wetted bed of the Kawarau River, and up to 0.6 m above water level during low flow conditions (Figure 33 and Figure 34). The intention of this design is to divert shallow flows in the Kawarau River around the outfall structure, thereby encouraging turbulence at the point of discharge and improved mixing (see GHD WQ report, Appendix A).

The proposed rock outfall will therefore alter the Kawarau River channel cross-sectional area (approximately 3.5% at low flows and up to 7% during flood flows), which may result in minor localised changes to flow paths and conveyance. However, these changes are not expected to significantly influence flood behaviour or dissipation of Lake Whakatipu water levels following flooding, and can be further improved through detailed design refinement. Any deviation from the current proposed rock outfall design is likely to see a reduction in potential hydrological impacts, such as in the case of a piped subsurface

diffuser arrangement (assumed minimal above-ground infrastructure on the wetted bed).

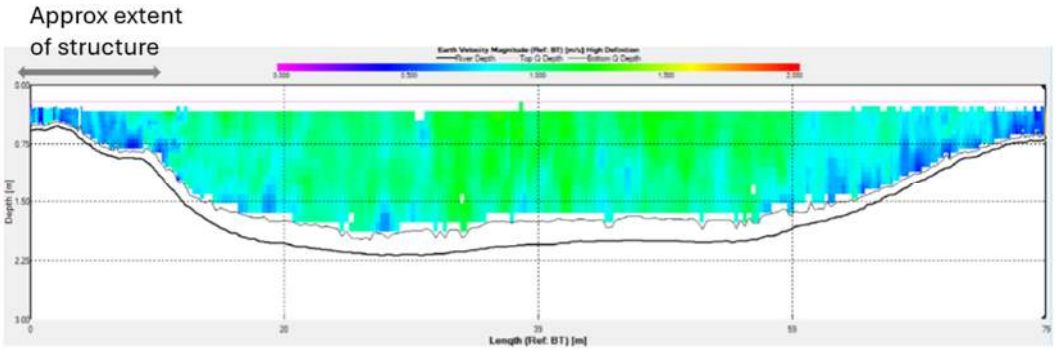

Figure 33: Cross section CX3 showing approximate extent of structure into Kawarau River (GHD, 2026)

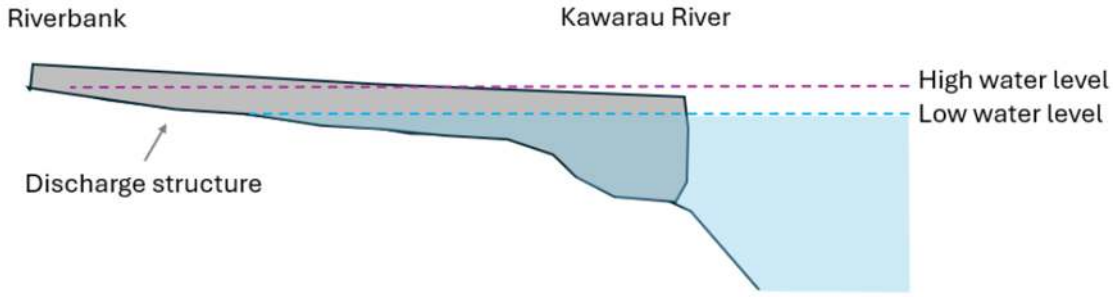

Figure 34: Schematic showing the change in cross sectional area submerged at high and low water levels (GHD, 2026)

The proposed wastewater discharge pipeline will be installed predominantly below ground surface; however, the civil preliminary design drawings identify that localised fill may be required in sections of the alignment to achieve minimum pipe cover. The extent of such fill is not fully quantified at preliminary design stage and has not been specifically assessed for its potential influence on overland flow paths or floodplain conveyance.

Any further measures to ensure flood-carrying capacity of the area is maintained will be confirmed at detailed design stage and implemented through construction controls and post-construction verification.

The treated wastewater discharge volume is negligible in magnitude relative to river flows and is not expected to significantly alter river flow regimes or water levels.

Accordingly, the proposal will result in no more than minor adverse effects on the hydrology of the Kawarau River, and no direct hydrological effects on the Kimi-ākau/Shotover River are anticipated. Indirect hydraulic effects on the Kimi-ākau/Shotover River are possible during flood events, however the GHD report indicates that these are likely to be less than minor.

5.4.4 Effects on Ecosystems

5.4.4.1 Ecological context

The ecological context for the proposal is presented in the EcIA (Appendix B). The receiving environment comprises the lower Shotover Delta (a highly dynamic braided river system) and the Kawarau River upstream and downstream of the Kimi-ākau/Shotover River confluence. Braided river ecosystems and associated gravel-bed habitats are, at the national scale, naturally uncommon and recognised as threatened ecosystems, and the Kawarau River is ecologically recognised for its diverse range of habitat types, including habitat for indigenous fish such as longfin eel and kōaro, alongside introduced salmonids[42].

The project area itself has a long history of modification (willow planting, weed colonisation, gravel extraction/quarry activities, four-wheel drive and motorbike recreational use and subsequent tracks, and flood protection works – see Figure 35), which is relevant when considering the sensitivity of terrestrial habitats within the construction footprint and the resilience of riverbed habitats to disturbance.

Figure 35: Shotover Delta and proposed WWTP outfall site as viewed from the Remarkables Trig on 13 May 2026 (source: Dawn Palmer)

5.4.4.2 Terrestrial ecology

Once construction is complete, the pipeline is subsurface and does not introduce a continuing source of terrestrial ecological effects other than any residual change in surface condition where design fill is used and where maintenance access is required.

[42] Boffa Miskell Ltd (2026): *Shotover WWTP – Ecological Impact Assessment*

The EcIA identifies an opportunity to treat reinstatement and any permanent fill areas as a restoration lever (e.g. controlled planting), but also recognises that in this environment success depends on ongoing management of rabbits, vehicle access, and weed reinvasion. As a matter of effects assessment, provided ground levels are appropriately reinstated and vegetation management is addressed through construction completion requirements, the long-term terrestrial ecological effects of the subsurface pipeline corridor are expected to remain insignificant.

5.4.4.3 Freshwater ecology

Freshwater field surveys undertaken in March 2026 at five Kawarau River sites (including upstream sites RS12–RS14, the proposed discharge location RS11, and downstream RS10) describe a mobile gravel-bed river margin habitat with generally sub-optimal physical habitat scores along the true left bank, limited fish cover, and high deposited sediment at RS11 and RS10 along the sampled margin.

Periphyton was generally low across sites, with most sites having high proportions of "no algae" and PeriWCC values in the "excellent" class, while localised features included moderate didymo cover at RS11 (proposed outfall site – resulting in reduced invertebrate habitat abundance) and extensive sludge mats at RS13 (one of the upstream sites). Notably, the Periphyton Risk Assessment prepared by Boffa Miskell (Appendix B2) demonstrates that periphyton growth in the Kawarau River is primarily controlled by physical factors other than nutrient supply, namely:

- Periphyton scouring via frequent high flows and substrate mobility;
- High suspended sediment loads, which reduce light availability;
- Cool water temperatures, even during low-flow periods; and
- Generally low baseline nutrient concentrations.

Macroinvertebrate communities were dominated by pollution-tolerant taxa, with macroinvertebrate index scores reflecting poor to fair classes and low EPT abundance at the sampled margins. These baseline observations provide context for both construction-related physical disturbance (which occurs in an already dynamic and disturbed edge environment) and for treated wastewater discharge-related ecological responses (which are most likely to be expressed initially along the near-bank plume pathway).

The ecological assessment relies on the discharge modelling and water quality predictions undertaken for the project[43], which describe an immediate near-field mixing area adjacent to the true left bank (with dilution increasing to approximately 5-fold by the downstream end of the structure), followed by further dilution through mixing at the

[43] GHD (2026) *Shotover WWTP – Surface Water and Groundwater Assessment*

Shotover confluence and a reasonable mixing outcome achieved at the downstream end of the Kimi-ākau/Shotover River confluence, as quantified at RS10. Under the conservative modelling scenario (2060 peak dry weather discharge and low river flow conditions), predicted ammoniacal-N and nitrate-N at RS10 are within the NPS-FM Attribute Band A range, while DRP remains elevated (within NPSFM Attribute Band D) at RS10, with further dilution expected after complete mixing (approximately 3.5 km downstream of the discharge).

The ecological effects of the proposed discharge are primarily associated with potential changes in water chemistry, particularly nutrient enrichment (ammoniacal nitrogen, nitrate-nitrogen and DRP), and the consequent risk of ecological response through periphyton growth and associated trophic pathways. The EcIA identifies that within the near-field mixing area adjacent to the outfall (approximately 40 m downstream along the true left bank), nutrient concentrations may be elevated relative to background conditions, with a possible subsequent localised increase in periphyton and macrophyte biomass. However, this zone is spatially limited both longitudinally and laterally, confined to a narrow near-bank plume that occupies only a small proportion of the river width (approximately one third), and is not the primary basis for assessing nutrient-related effects on aquatic ecology. As a result, the magnitude of any ecotoxicity related effect within the near-field mixing area is expected to be limited.

Beyond this immediate zone, the EcIA adopts an effects assessment at the point of reasonable mixing (as measured at RS10), consistent with sections 70(1) and 107(1) of the RMA (and, in relation to the WCO, Schedule 3 of the RMA), where the discharge is predicted to be substantially diluted. At this location, modelled nutrient concentrations are significantly reduced, with ammoniacal nitrogen and nitrate-nitrogen returning to Attribute Band A and within Schedule 15 limits, while DRP remains elevated but is not expected to significantly impact periphyton accrual or contribute to direct ecotoxicity.

Notwithstanding the predicted elevation of DRP at RS10, the EcIA concludes that the magnitude of ecological effect is negligible when assessed in the context of the receiving environment – particularly when considering the residual groundwater contamination effects from the DAD operation. This reflects the inherent characteristics of the Kawarau River, including high hydraulic disturbance, mobile gravel substrates, elevated suspended sediment loads, and limited habitat stability, which collectively constrain sustained periphyton accrual and broader ecological response to nutrient enrichment. This is confirmed by the periphyton risk assessment (Appendix B2), which determines that the proposed discharge poses a low risk of excessive periphyton growth in the Kawarau River.

Macroinvertebrate communities in the reach are already dominated by pollution-tolerant taxa, and there is limited evidence to indicate that the predicted changes in water chemistry would result in a measurable shift in community composition, trophic structure, or ecosystem function.

5.4.4.4 Proposed mitigation and monitoring

Mitigation for the operational discharge is based on a combination of design-based avoidance, treatment optimisation, and long-term monitoring with adaptive management.

At the outset, the discharge location, outfall design, and wastewater treatment processes have been selected and refined to minimise contaminant concentrations and maximise dilution within the receiving environment, representing the primary avoidance and minimisation steps in the effects management hierarchy.

In terms of specific mitigation measures, the EcIA recommends ongoing ecological and water quality monitoring to verify predicted effects and ensure that no unanticipated adverse ecological responses occur. Monitoring will focus on key indicators of ecological health, including periphyton growth, deposited sediment, and macroinvertebrate community composition, at upstream and downstream sites relative to the discharge.

This monitoring framework is supported by an adaptive management approach, whereby any identified adverse ecological trends or deviations from predicted outcomes will trigger further investigation and, where necessary and because of the discharge, implementation of additional mitigation or management measures.

Additional operational controls include consideration of fish exclusion as far as practicable to prevent fish from entering the discharge pipes and/or structure, development of a maintenance plan for guiding post-flood event works on the outfall structure, and management of any periodic maintenance activities to ensure that disturbance remains localised and short-term.

Overall, the operational mitigation strategy relies on ensuring discharge quality is maintained at a high standard, confirming effects through monitoring, and retaining flexibility to respond to any unforeseen ecological effects over the life of the consent.

5.4.4.5 Overall effects on ecology

The below table summarises the assessed level of ecological effects as presented in the EcIA, for both pre- and post-mitigation scenarios.

Table 24: Summary of the assessment of ecological effects for the proposed treated wastewater discharge (Boffa Miskell, 2026)

Ecological Component	Component / Effect	Ecological value	Overall level of effect	
			Pre-mitigation	Post-mitigation
Avifauna	Changes in water quality	Low – Very High	No Effect	No Effect

Kawarau River	Physical habitat modification	High	Very Low	Very Low
	Changes in water quality – Physical chemistry	High	Very Low*	Very Low
	Changes in water quality – Nutrients	High	Very Low*	Very Low
	Changes in water quality – Metals and other contaminants	High	Very Low*	Very Low
	Changes in water quality – Suspended solids	High	Very Low*	Very Low
	Changes in water quantity	High	Very Low	Very Low
	Ongoing structure maintenance	High	Very Low	Very Low

* The pre-mitigation level of effect for changes in water quality effects for the Kawarau River represent the mitigated discharge scenario following treatment and minimisation actions already undertaken.

Overall, based on the information and conclusions provided in the report, after reasonable mixing:

- there are no anticipated adverse effects on terrestrial ecology due to the proposed treated wastewater discharge; and
- effects on aquatic ecology due to the treated wastewater discharge are expected to be no more than minor.

5.4.5 Effects on Public Health

The proposed discharge of highly treated wastewater from the WWTP to the Kawarau River has been assessed with respect to potential effects on public health, primarily in relation to recreational water users, including swimmers, kayakers and other contact recreation activities. The principal public health risk associated with treated wastewater discharges is exposure to microbial pathogens, particularly enteric organisms, through ingestion of water or inhalation of water aerosols during recreational use. Sections 6 and 7.4 of the GHD WQ Report (Appendix A) assess the public health risk and effects, respectively, associated with the proposed treated wastewater discharge.

The assessment identifies that wastewater may contain a range of pathogens, including bacteria (e.g. *Campylobacter*), protozoa and viruses (e.g. norovirus and adenovirus), with the level of risk dependent on residual pathogen concentrations following treatment, environmental attenuation processes, and the nature and frequency of human exposure. The primary exposure pathway for recreational users is ingestion

during full-contact activities such as swimming, with inhalation and secondary contact pathways representing a lower level of risk.

The performance of the existing and proposed treatment processes is a key determinant of residual risk. Monitoring demonstrates that the Shotover WWTP achieves a relatively high level of faecal indicator level removal, with treated wastewater exhibiting similar median and lower 95th percentile *E. coli* concentrations to the upstream Shotover sample point following recent upgrades. The treatment train - including secondary biological treatment and UV disinfection - provides multiple barriers to pathogen transmission, and further upgrades (including tertiary filtration and enhanced UV treatment) are expected to improve removal of both particulate-associated microorganisms and viruses, and increase the overall reliability of disinfection performance.

Predicted microbial water quality in the receiving environment indicates that, after reasonable mixing, and excluding the influence of the Shotover River, *E. coli* concentrations are expected to remain low (with 95th percentile concentrations approximately 29 cfu/100 mL); well within the national bottom line for contact recreation water quality under the NPS-FM[44]. The *E. coli* concentrations after reasonable mixing are predicted to achieve Attribute Band A (Blue) for human contact, with predicted concentrations corresponding to an "Excellent" attribute band for bathing sites when excluding the Shotover River influence, and likely to be "Fair" attribute band for bathing sites when the catchment sourced *E. coli* load is included. These attribute bands indicate a low risk of *Campylobacter* infection and illness both within the near-field mixing area and after reasonable mixing.

A quantitative assessment of norovirus illness risk has been undertaken based on New Zealand-specific pathogen–indicator relationships and quantitative microbial risk assessment methods. This analysis uses *E. coli* concentrations as a conservative indicator of pathogen risk, drawing on established relationships between faecal indicator bacteria, viral markers (e.g. CrAssphage), and norovirus occurrence. The assessment concludes the following:

> *The predicted concentrations for E.coli within the near-field mixing area are below this threshold, suggesting an upper bound individual infection risk in the order of 2%, with actual risk more than 95% of the time being significantly lower than this. In this context it is considered that the norovirus individual infection risk to recreational use of the Kawarau River immediately beyond the discharge structure and after reasonable mixing is low.*

The assessment also recognises that upstream catchment inputs and natural background sources may contribute to *E. coli* concentrations in the Kawarau and Kimi-ākau/Shotover rivers, and in some cases exceed concentrations measured in treated

[44] NPS-FM Table 22

wastewater. This suggests that the proposed discharge is not the dominant driver of microbiological water quality in the receiving environment, and that dilution, natural attenuation, and high river flows further reduce the relative contribution of the discharge to downstream pathogen concentrations.

Taking these factors into account, the potential effects of the discharge on public health are assessed as low. After reasonable mixing in the Kawarau River, water quality is predicted to remain suitable for contact recreation and consistent with the requirements of the Water Conservation (Kawarau) Order, which requires that the water be managed to a Class CR standard after reasonable mixing (in turn requiring, under RMA Schedule 3, clause 5, the maintenance of water quality suitable for bathing and no undesirable biological growths as a result of discharged contaminants).

Residual uncertainty primarily relates to variability in pathogen concentrations and environmental conditions. However, this is appropriately addressed through the proposed programme of ongoing monitoring, refinement of the quantitative microbial risk assessment (QMRA), and the potential for additional UV disinfection infrastructure should monitoring indicate it is necessary. This adaptive management approach provides a high degree of confidence that any unforeseen risks can be identified and mitigated over time.

With limited residual risk, and the expected exposure scenarios, it is considered that the potential effects to public health associated with the discharge are less than minor. This is particularly the case in the context of existing water quality effects from the Shotover River Catchment. The proposed discharge is considered to meet the WCO requirement for maintaining a standard suitable for bathing after reasonable mixing.

5.4.6 Effects on Recreation and Commercial Use

Potential adverse effects from the proposal on recreational and commercial uses in the vicinity of the proposed long-term discharge location can be separated into the following categories:

- Adverse effects from the construction, operation and maintenance of the wastewater conveyance pipeline and outfall on and adjacent to the riverbed; and
- Adverse effects from the discharge of treated wastewater to the Kawarau River.

The former category is addressed in Section 5.6.5, while the latter is addressed below, and is based on the information and conclusions provided in the Rec Report (Appendix C).

The discharge of treated wastewater to the Kawarau River has the potential to result in adverse effects on recreation and commercial use primarily through changes to water quality, associated human health risk, and the perception of water quality.

Within the near-field mixing area, the Rec Report identifies a moderate adverse effect on recreation in a high-use setting, based on conservative modelling of microbial health risk and the expectation that some users may avoid the immediate discharge area (and within the area signed) despite the low likelihood of infection. This near-field mixing area is characterised predominantly by secondary contact recreation, such as jet boating, kayak launching and angling, rather than primary contact activities, and the moderate effect rating reflects a health risk assessment of 'low-risk' health determination[45] in what is a 'high-use' recreation area.

Beyond the near-field mixing area, the influence of the discharge reduces rapidly as a result of dilution and entrainment within the Kawarau River and at the Shotover confluence. The assessment identifies that dilution increases to approximately five-fold within around 40 m of the discharge and continues downstream such that, by approximately 800 m downstream (represented by monitoring site RS10), the discharge constitutes an insignificant proportion of the total river flow. At this location, which corresponds to a recognised primary contact recreation area, the *E. coli* 95th percentile is assessed as falling well within the 'Excellent' NPS-FM attribute band for primary contact sites. On this basis, the report concludes that the proposed discharge 'does not materially impair primary contact recreation quality at the 800 m downstream swimming area.'

The assessment also confirms that, at a broader scale, catchment-derived sources of contamination are the dominant contributors to water quality, rather than the treated wastewater discharge itself. As a result, the discharge is not expected to materially alter recreation-related water quality conditions at locations where the majority of public and commercial activities occur.

With regards to commercial activities, the Rec Report states that the design of the rock outfall does not inhibit access to the majority of the study area and does not significantly interfere with secondary contact activities such as jet boating or kayaking. However, the assessment identifies that perception of water quality is a key determinant of recreational behaviour, and that awareness of a wastewater discharge, visible indicators, or signage may influence user confidence and participation, particularly in proximity to the outfall. These perception effects are recognised as a legitimate component of the effects assessment but are considered to be spatially confined to the immediate discharge area, and are not expected to result in widespread displacement of recreation or commercial activity across the wider Kawarau River corridor.

Overall, the recreation assessment concludes that the adverse effects on recreation will be negligible to minor within the near-field mixing area, and negligible beyond this area. Thus, overall recreation effects from the discharge of treated wastewater to the Kawarau

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River are assessed as no more than minor and the proposal will sustain the recreational values of the area.

5.4.7 Effects on Natural Character and Amenity

The following subsections assess the effects of the proposed discharge of treated wastewater to the Kawarau River, along with the permanent presence of the physical structures on or adjacent to the riverbed. The assessment is based on the information and conclusions provided in the LNCA Report (Appendix D).

5.4.7.1 Natural character effects

The treated wastewater discharge will result in localised adverse effects on water quality and associated natural character values within the near-field mixing area. Within this area, measurable changes in water quality are predicted, including elevated nutrient concentrations and localised exceedances of NPFM and ORC Schedule 15 guideline thresholds.

However, the report clearly states that these effects are highly localised and dissipate rapidly through dilution and mixing, with water quality and ecological indicators returning to near-baseline conditions particularly following mixing with the Kimi-ākau/Shotover River. At a reach scale, effects on aquatic ecology are assessed as negligible, attributed to the pollution-tolerant taxa and highly dynamic river system.

Physical modification of the riverbed associated with the outfall structure introduces a small, permanent change to channel morphology and bed substrate, including placement of rock riprap and localised narrowing at the margin. These effects are described as low and highly localised at the site scale, and negligible at reach scale, reflecting the limited footprint relative to the size and dynamics of the river system, and changes to the natural biotic condition of the site through river engineering works (the training line in particular).

With regards to river margins, the proposal will cause minor and localised permanent change to bank form, vegetation patterns and margin character, including removal of some vegetation and introduction of engineered rock. However, these effects occur within an already modified environment and are mitigated through reinstatement planting, with overall effects on river margins assessed as negligible to low at reach scale.

5.4.7.2 Landscape and visual effects

Permanent landscape effects are primarily associated with the outfall structure, which introduces a small area of modification at the river margin and active bed interface, including replacement of existing alluvial gravels with engineered rock materials and a slight localised alteration to the natural edge condition. While this represents a permanent change, the report emphasises that it is limited in spatial extent, visually recessive in design, and located within an already modified floodplain environment.

The proposal will also result in direct effects on existing vegetation (mostly exotic plantings on the training line embankment and sparse vegetation at the proposed outfall site), via vegetation clearance and infilling around established trees in places. While this will temporarily disrupt the existing pattern of exotic vegetation and ground cover, proposed post-construction planting (particularly around the outfall, but also over the disturbed pipeline corridor, if appropriate) presents an opportunity for enhancement via introduction of both native and exotic riparian species, where this doesn't conflict with flood management priorities and effects on ORC's training line.

The conveyance pipeline will be buried and existing ground levels either reinstated or infilled and stabilised, such that it will be largely imperceptible in the long term, with landform and surface conditions generally returning to pre-construction levels – better, if native seed mixes are successfully used to re-establish disturbed ground. As a result, long-term landscape effects are confined to the outfall location.

Visual effects in the operational phase are assessed as very low to low and highly localised, with the outfall designed to integrate with the surrounding river edge through the use of natural materials and low-profile design. Visibility is limited to close-range viewpoints, with effects diminishing rapidly with distance and not affecting the wider visual catchment

Based on the above, the report concludes the following: *Overall, the direct landscape effects are localised in extent, largely confined to the pipeline corridor and outfall area, and sit within an already modified floodplain environment, such that the magnitude of permanent change is low, and effects on the immediate landscape are low (adverse minor)*.

5.4.7.3 Cumulative landscape effects

The report states that there is a discernible incremental effect on landscape both at site-scale (including tracks, jumps, roads, and gravel extraction pits) and at a larger scale (Queenstown Airport runway extension and the wastewater treatment plant itself, for example). However, the scale of the proposal is limited and contained, and subsequent cumulative landscape effects are low in magnitude and avoid materially eroding the broader wild, scenic and recreational qualities of the Kawarau River system. The report therefore concludes that cumulative landscape effects from the proposal are less than minor.

5.4.7.4 Overall natural character and amenity effects

Overall, the landscape and natural character assessment concludes the following, with regards to the long-term discharge:

- Negligible to low natural character adverse effects on the active bed;
- Negligible to very low natural character adverse effects on the Kawarau River margin;

- Very low natural character adverse effects on the Kawarau/Shotover Reach context;
- Low to negligible adverse natural character effects overall;
- Low and localised adverse landscape effects;
- Very low to low adverse visual effects; and
- Less than minor cumulative landscape effects.

Based on the assessment provided in the LNCA report, adverse effects from the permanent structure and long-term wastewater discharge are considered to be no more than minor.

5.4.8 Cultural Effects

While Kā Rūnaka were engaged from October 2024 in relation to the options assessment process (including fortnightly hui that commenced in April 2025), no formal cultural impact assessment has been undertaken by Kā Rūnaka for this application due to the timing of a decision being made by Council on the preferred option in March 2026, meaning that the preliminary design has only been completed a few weeks prior to this application being made, and timeframe limitations under the Enforcement Order mean that this application must be submitted by 31 May 2026. A summary of cultural values within the discharge area, as QLDC understands them to be, are outlined in section 3.10.

However, the applicant has recently engaged in consultation with Aukaha and TAMI representatives in a limited capacity via a brief hui ahead of this application being submitted to ORC, but will continue their dialogue following lodgement. The cultural position statement (Appendix H) provided to QLDC as part of the optioneering process is also relevant in providing an indication of the likely cultural effects from the proposed discharge.

QLDC is well aware that Kā Rūnaka are concerned about, and opposed to, activities that directly affect the water quality of the Kawarau River. QLDC acknowledge that any discharge of treated wastewater is culturally offensive as it will diminish the mauri of the awa tupuna, threaten the Ki Uta Ki Tai philosophy, and impact on the ability of tangata whenua to exercise culture and traditions, including mahika kai practices.

This recognition of the discharge of treated wastewater to waterbodies being an affront to Kai Tahu is also included in the RPW as Issue 4.13.5 with the explanation:

> *"The discharge of untreated and treated human waste and other contaminants to water bodies is particularly offensive to Kai Tahu, since water is of both spiritual and practical importance to the indigenous culture of Otago. Degradation of any water body undermines the enduring cultural relationship iwi have traditionally enjoyed and seek to retain with their waters. In addition, the custom of gathering food (mahika kai) from water bodies is jeopardised, since the practice of*

consuming food gathered from resources contaminated by, in particular, human wastes is abhorrent to iwi. Severance of the spiritual relationship with, and of the customary use of, a water body strikes at the very identity and well being of the indigenous culture. This causes a failure as kaitiaki to protect and pass on to the next generation an intact mahika kai custom."

Awareness of the importance of cultural values linked to the awa was one of the drivers in determining options for an appropriate long-term solution with input from Kā Rūnaka through representatives at Aukaha and Te Ao Marama. However, as outlined in the assessment of alternatives (Section 1.2), ultimately a solely land-based solution was not identified as being feasible or practicable for the Queenstown community. What was made clear is that Kā Rūnaka oppose any discharge option utilising the Shotover delta and that land passage options located on the delta, such as wetlands, to provide land contact prior to discharge were also not supported.

This proposed discharge directly to the Kawarau River does not avoid the cultural offensiveness of treated wastewater discharges to water, however, a number of additional mitigation measures and conditions have been proposed that in some way recognise and respond to the adverse cultural effects of the construction and long-term discharge. These include:

(a) Mechanisms to significantly further upgrade the treatment of the wastewater, including the installation of tertiary filtration, chemical dosing and enhanced UV disinfection;

(b) Ensuring the outfall is into higher velocity flow to encourage rapid mixing and minimise the effects on water quality and instream ecology after reasonable mixing to provide for maintenance of existing mahinga kai values;

(c) An offer to establish a Kaitiaki Advisory Group (condition (28));

(d) Inviting input from Kāi Tahu representatives on draft management and monitoring plans required by conditions (condition (28)(h));

(e) Requiring that all information under the conditions to be provided to ORC is also provided to the Kāi Tahu representatives (condition (28)(h));

(f) Inviting the Kāi Tahu representatives to work with it to:

  a) develop cultural monitoring programmes (condition (28)); and/or

  b) identify and discuss the delivery of opportunities for collaboration to enhance the environment of the Kawarau River and the Kimi-ākau/Shotover River in the wider vicinity of the SWWTP, including to respond to the cultural and historical context of the site and surrounding environment (condition (28)(e));

(g) Developing, every 10 years, a Wastewater Management Review Report to consider changes in wastewater treatment and discharge options, district growth patterns and wastewater management options that have occurred over the preceding 10 years, and to provide a review of options (including their costs) in relation to potential changes to the plant or the discharge (including discharge options and discharge volume reductions) (condition (27)).

In light of the above, effects on cultural values will be more than minor and have the potential to be significant.

5.4.9 Effects on Natural Hazards

In accordance with clause 7(f) of Schedule 4 of the RMA, the potential risks to the neighbourhood, wider community, and environment from natural hazards and hazardous installations have been considered. The proposed works comprise predominantly subsurface infrastructure (including pipelines) and an outfall within the Kawarau River. These elements do not involve the storage, use, or transport of hazardous substances in quantities that would give rise to a hazardous installation risk. As such, no credible pathway has been identified by which the proposal would pose a risk to people or the environment from hazardous installations.

In terms of natural hazards, the primary consideration relevant to the proposal is flood hazard and potential effects on floodplain hydraulics. The pipeline works will be installed below ground with reinstatement at or close to existing ground levels (pending detailed design), and are therefore not expected to alter flood storage capacity, conveyance, or overland flow paths. The proposed outfall will be located within the active river channel and is of a scale and design that is not expected to materially impede flows or alter flood behaviour. At most, any localised disturbance to flow patterns would be minor and confined to the immediate vicinity of the structure, with the GHD report stating that the '*...small changes in [river channel cross sectional] area are therefore considered unlikely to result in damming effect or influence return flow, beyond the natural state that has existed in the past.*' Accordingly, the proposal is expected to result in a less than minor adverse effect in flood hazard risk, and no measurable increase in risk to the surrounding community or environment from natural hazard processes.

5.5Discharge to air

Air Quality Consulting NZ (ACQNZ) (refer Appendix E) have undertaken an assessment of potential odour effects, with a summary of the assessment provided below. The assessment considers potential odour discharges from the main WWTP process areas and the proposed outfall, with separate assessments provided due to the large separation distance between the plant and outfall, varied nature of potential odour discharges at each site, and different receiving environments.

5.5.1 Effects of odour from outfall

A qualitative assessment of the potential odour effects associated with the proposed outfall has been undertaken to support the air quality component of the application. This assessment has been carried out in accordance with the Ministry for the Environment's Good Practice Guide for Assessing and Managing Odour (MfE GPG Odour, 2016), which outlines a range of tools for evaluating odour effects. In this case, the FIDOL framework has been applied, which considers the key factors that influence odour impacts — namely Frequency, Intensity, Duration, Offensiveness, and Location (refer to Table 25).

The effects assessment has been informed by meteorological data from the nearby Queenstown Airport meteorological station (Figure 25).

Table 25: Proposed outfall odour FIDOL Factors

FIDOL	Findings
Frequency	Frequency refers to how often odours may be experienced at off-site receptor locations. The wind rose in Figure 25 shows that light winds (i.e. winds below 3 m/s) occur from a variety of directions, with no more than 9% of light winds coming from any single direction. Light winds capable of transporting odours towards the nearest residential area to the north (i.e. winds from the south through to the southwest) occur less than 6% of the time. This represents a low frequency of occurrence. Given the infrequent nature of strong odours that could cause nuisance effects, combined with the low frequency of light winds blowing towards sensitive receptors, it is unlikely that odours will be regularly experienced at off-site locations.
Intensity	Treated wastewater has the potential to produce odours with a 'musty', 'earthy', or occasionally 'algae-like' character. These generally have a low odour intensity and are not considered offensive in most cases. Based on experience, odour intensity from the outfall is expected to be no more than "distinct", with typical observations being "very weak" or not detectable at all. Furthermore, as the odour travels downwind of the outfall, it will disperse and the odour intensity will reduce.
Duration	The generation of odour from the outfall is expected to be relatively continuous. However, it is unlikely that receptors would experience odour for any significant periods of time, given the other factors involved, such as the low odour intensity, distance to receptors and low

	frequency of suitable wind conditions (i.e. poor dispersive low-speed/calm winds). Overall, the likelihood of receptors observing odours for any meaningful duration of time is considered low.
Offensiveness	While treated wastewater can emit odour, the character ('musty', 'earthy', or 'algae-like') of such odour is not typically considered offensive, particularly given its low intensity and that as it disperses, it dilutes in the ambient environment. Overall, odours associated with the outfall are unlikely to be considered offensive or objectionable.
Location	The location of the outfall relative to sensitive receptors is an important consideration. The nearest highly sensitive receptors (primarily residential receptor locations) are >1,000 m to the northeast of the outfall. There are commercial properties which have a lower sensitivity to odours located a similar distance to the northwest. There is also the potential for people using the Kawarau River to experience odour, however, it is likely that the frequency of exposure will be low. Overall, the buffer of ~1,000 m to fixed receptors should provide a sufficient distance for any residual odours to disperse and not result in offensive or objectionable odours at the nearest receptor locations. While there is potential for mobile receptors (i.e. recreational or commercial users of the Kawarau River and Shotover Delta) to be exposed to odours in close proximity to the outfall, this is highly localised, and objectionable or offensive odours are not anticipated under normal (day-to-day) operation of the WWTP.
Overall Odour Assessment	Considering the relatively low frequency of light winds that can cause effects, low intensity of odours discharged and distance to receptors, the odour emissions from the outfall are unlikely to cause offensive or objectionable effects at off-site receptor locations.

5.5.2 Odour effects from WWTP

While RM13.215.01 already authorises potential odour-related effects from the operation of the WWTP, a replacement to this consent (or subsequent interim replacement via RM25.206.03) is being sought primarily to align the expiry date on the air discharge consent with the other consents being sought as part of this long-term discharge application. The following WWTP odour assessment is based on the Odour Report by ACQNZ (Appendix E), which utilises the FIDOL framework and also draws data from the nearby Queenstown Airport meteorological station.

The below assessment is based on WWTP infrastructure and processes that will be in operation at the time of commissioning the new Kawarau River outfall, which includes further wastewater treatment improvements as detailed in Section 2.4 of this report.

Table 26: Main WWTP processing area odour FIDOL factors (source: GHD)

FIDOL	Findings
Frequency	Frequency refers to how often odours may be experienced at off-site receptor locations. For the WWTP, the frequency of odour exposure depends on both the occurrence of odour generating conditions at the plant and the frequency of low-speed winds blowing from the WWTP towards nearby receptors. Low speed winds, being winds below 3 m/s, are most relevant to odour effects as atmospheric dispersion is more limited under these conditions. At higher wind speeds, there is generally greater mixing and dilution, which reduces the likelihood of odours remaining concentrated as they travel downwind. The wind rose in Figure 25 shows that low speed winds occur from a range of directions, although the frequency varies by direction. The closest residential receptors are located approximately 200 m to the north of the main WWTP process areas, meaning winds from the south are relevant for potential odour transport towards these receptors. Residential receptors are also located approximately 350 m to the east, for which winds from the west are relevant. Commercial receptors are located approximately 230 m to the southwest and west, for which winds from the northwest and east are relevant, respectively. Based on Figure 25, the maximum frequency of low-speed winds from any single direction is approximately 9%. Low speed winds from the directions relevant to nearby residential receptors are typically less than 6%, while low speed winds towards other nearby receptor groups also occur relatively infrequently. These conditions do not represent a dominant wind pattern, indicating that poorly dispersed odours are unlikely to be frequently transported towards any one receptor group.
Intensity	Wastewater treatment activities have the potential to generate sulphurous, septic, musty, earthy, or organic wastewater type odours. The highest odour generation potential is generally associated with raw wastewater handling, septage reception, screenings, grit handling, scum handling, and sludge storage or dewatering. Odour generation from the MLE reactors and clarifiers is expected to be lower during normal operation, as the process is aerated and managed to maintain biological treatment performance. Based on the nature of the sources and the controls in place, odour intensity beyond the

	site boundary is expected to generally be weak to distinct, with higher intensity odours only expected under abnormal or upset conditions.
Duration	Some WWTP activities occur continuously, including receipt and treatment of wastewater. However, the generation of more noticeable odours is expected to be intermittent and linked to specific activities or operating conditions, such as screenings handling, septage unloading, sludge handling, scum accumulation, low dissolved oxygen conditions, equipment failure, or biological process upset. The current Odour Management Plan (OMP) required under RM13.215.01 identifies specific operational controls and monitoring requirements for key odour sources, including the inlet works odour treatment system, MLE odour treatment system, MLE reactors, clarifiers and WAS holding tank. An updated OMP will be provided as part of the performance monitoring suite for the present discharge to air permit being sought. While receptors may occasionally be downwind of the WWTP during light wind conditions, the likelihood of receptors experiencing odour for any meaningful duration is considered low, particularly given the separation distances to the nearest sensitive receptors and the treatment and management measures in place.
Offensiveness	Odours from untreated wastewater, septage, screenings, scum and sludge have the potential to be offensive if they are experienced at sufficient intensity and duration. However, odours associated with biologically treated wastewater and efficiently operating activated sludge systems are generally less offensive and may be characterised as musty, earthy or organic. The potential for offensive odours is therefore most closely associated with raw wastewater handling, septage reception, sludge handling, process upsets, or failure of odour control systems. Provided the WWTP is operated in accordance with the OMP and any updates/replacements to such, including maintaining odour treatment systems, managing screenings and sludge, and responding to abnormal operating conditions, odours at off-site receptors are unlikely to be offensive or objectionable.
Location	The location of the WWTP relative to sensitive receptors is an important consideration. The nearest residential receptors are located approximately 200 m to the north of the main WWTP process areas, with further residential receptors approximately 350 m to the east across the Kimi-ākau/Shotover River. Commercial receptors are located approximately 230 m to the southeast and west of the process areas. These distances provide some opportunity for odour dispersion before reaching off-site receptors, although the northern residential receptors are relatively close to the WWTP. The potential for odour effects at each receptor group depends on wind direction as well as distance. Winds from the south are required to transport odours towards the northern residential receptors,

	winds from the west towards the eastern residential receptors, winds from the northwest towards the southeast commercial receptors, and winds from the east towards the western commercial receptors. The wind rose in Figure 25 indicates that low speed winds from these specific directions occur relatively infrequently. Overall, the separation distances, receptor sensitivity, low frequency of receptor-relevant low speed winds, and odour management controls are expected to reduce the potential for offensive or objectionable odour effects beyond the site boundary.
Overall Odour Assessment	The main WWTP process areas have the potential to generate odours from raw wastewater handling, inlet works, septage reception, biological treatment processes, clarifiers, scum handling, WAS storage, sludge dewatering and related pump stations. Some of these odours have the potential to be offensive if they are experienced at sufficient intensity and duration, particularly during abnormal or upset conditions. However, the key odour generating areas are subject to operational controls, odour treatment, aeration, monitoring and maintenance under the OMP. The nearest residential receptors are located approximately 200 m to the north and 350 m to the east of the main process areas, with commercial receptors approximately 230 m to the southeast and west. The wind rose indicates that low speed winds, being the conditions most relevant to poorly dispersed odour effects, occur from a range of directions. However, the maximum frequency of low-speed winds from any single direction is approximately 9%, and low speed winds from directions relevant to nearby residential receptors are typically less than 6%. Considering the nature of the odour sources, the odour controls in place, the separation distances to receptors, and the relatively low frequency of low-speed winds blowing from the WWTP towards nearby residential receptors, odour emissions from the WWTP are unlikely to cause offensive or objectionable effects beyond the site boundary. This conclusion is also supported by the limited number of odour complaints associated with the WWTP, which indicates that odour effects are not regularly experienced at off-site locations ACQNZ notes that following the Stage 3 upgrades and with further proposed improvements prior to commissioning the new Kawarau River outfall, the likelihood of complaints is expected to further reduce.

5.5.3 Cumulative odour effects from WWTP and proposed outfall

While the WWTP and outfall are physically linked, their odour sources and emission characteristics are significantly different. The WWTP itself has the potential to generate stronger and more offensive odours, particularly from raw wastewater handling, inlet works, septage reception, screenings and grit handling, scum handling, sludge storage and dewatering, and abnormal biological treatment conditions. In contrast, the outfall

will discharge highly-treated wastewater that is expected to have a much lower odour potential.

The cumulative effects of odour will depend on whether odours from both sources can be experienced simultaneously at sensitive receptors, or if the outfall could significantly increase the odour potential already associated with the WWTP. Based on the FIDOL assessments, odour from the outfall is unlikely to be detectable at sensitive receptor locations due to the low odour intensity, the separation distance to receptors, and the low frequency of meteorological conditions that would transport poorly dispersed odours towards those receptors.

While there is the potential for odour from the WWTP to be detectable off-site, this would not typically coincide with odours from the outfall being detectable to off-site receptors, due to differing emission strengths, wind conditions, and significant spatial separation. The Odour Report states that the outfall is not expected to materially add to odour effects from the WWTP.

Taking these factors into account, ACQNZ considers the risk of adverse cumulative odour effects to be low.

5.5.4 Overall odour effects

The assessments provided above consider that odour emissions from both the upgraded WWTP and the proposed outfall are unlikely to cause offensive of objectional effects at off-site receptors or to receptors at the outfall. The assessment also considers the potential adverse cumulative odour effects from the combined operation of the WWTP and outfall to be low. On this basis, the overall odour effects are anticipated to be less than minor.

5.6Riverbed works (pipeline and outfall construction)

Sections 2.6.4 and 2.6.5 of this report provides details of the temporary works associated with the commissioning of the wastewater conveyance pipeline and outfall. In order to install both the pipeline and outfall, localised vegetation clearance and earthworks will be required. This section assesses the potential environmental effects that will need to be managed in association with the temporary works.

Where directly relevant, matters for council discretion have been directly assessed in the following sections. These matters are listed as follows, and relate to the potential take of groundwater for dewatering in association with the pipeline and outfall earthworks, and the excavation of alluvium in relation to the outfall construction:

Rule 12.2.3.4 relevant matters for council discretion (groundwater abstraction):

(i) The maximum allocation limit for the aquifer; and

(iA) The assessed maximum annual take for the aquifer; and

(ii) The mean annual recharge of the aquifer; and

(iii) The effect of the take on the hydrodynamic properties of the aquifer and the vulnerability of the aquifer to compaction; and
(iv) Whether any part of the take would constitute allocation from any connected perennial surface water body, and the availability of that allocation; and
(v) The rate, volume, timing and frequency of groundwater to be taken and used; and
(vi) The proposed methods of take, delivery and application of the groundwater taken; and
(vii) The source of groundwater available to be taken; and
(viii) The location of the use of the groundwater, when it will be taken out of a local catchment; and
(x) The consent being exercised or suspended in accordance with any Council approved rationing regime; and
(xi) Any adverse effect on the existing quality of groundwater in the aquifer; and
(xiii) Any actual or potential effects on any surface water body; and
(xvii)Any adverse effect on any lawful take of water, if consent is granted, including potential bore interference; and
(xviii)Whether the taking of water under a water permit should be restricted to allow the exercise of another water permit; and
(xxii)The information, monitoring and metering requirements; and

Rule 13.5.2.1 matters for council discretion (alluvium extraction):
(a) Any adverse effects of the activity on:
- *(i) Any natural and human use value identified in Schedule 1 for any affected water body;*
- *(ii) The natural character of any affected water body;*
- *(iii) Any amenity value supported by any affected water body; and*
- *(iv) Any heritage value associated with any affected water body; and*

(d) Any adverse effect on a defence against water; and
(e) The quantity of alluvium to be extracted, and the location and the method of removal; and
(f) Any adverse effect on existing public access; and
(g) The duration of the resource consent; and
(h) The information and monitoring requirements; and
(i) Any existing lawful activity associated with any affected water body; and
The review of conditions of the resource consent. Except in the case of extraction from the wet bed of a lake or river, or within a Regionally Significant Wetland, the Consent Authority is precluded from giving public notification of an application for a resource consent under this rule.

5.6.1 Effects on Groundwater

As discussed elsewhere in this report, excavations associated with the proposed pipeline and outfall construction may encounter groundwater, particularly on the basis that the underlying Shotover Alluvial Ribbon Aquifer (as per ORC's Consents in Otago viewer) is shallow, with a strong hydraulic connection to surface water (the Kimi-ākau/Shotover River in particular)[46]. GHD (2026) stated that groundwater monitoring undertaken since April 2025 indicates that groundwater levels between the DAD and Kawarau River are within 0.5m depth below, or in fact above, ground surface for extended periods during spring. Outside of these high flow periods, groundwater depth appears to vary between a maximum depth of approximately 1.5 to 1 m below ground level (bgl).

Based on the preliminary civils drawings (Appendix K), the possible depth to invert for the pipeline installation ranges from approximately 1.5 m to 3 mbgl. This indicates that groundwater dewatering is likely required, on the basis of the current design. While in some instances a small amount of groundwater may not require dewatering for the works to progress, it is assumed that most of the pipe trenching and outfall construction works will need to be undertaken within a dry substrate.

The below table assesses the matters for council discretion, in relation to groundwater dewatering requirements.

Table 27: Temporary dewatering effects assessment

Matter for consideration/discretion	Assessment
(i) The maximum allocation limit for the aquifer; and	ORC's Consents in Otago GIS interface shows that the allocation limit as at May 19, 2026 is 6,447 l/s.
(iA) The assessed maximum annual take for the aquifer; and	~456 l/s, according to Consents in Otago
(ii) The mean annual recharge of the aquifer; and	Not known
(iii) The effect of the take on the hydrodynamic properties of the aquifer and the vulnerability of the aquifer to compaction; and	A very conservative estimate, based on average trenching depths and reported groundwater levels, suggests that dewatering may range from 5 – 15 l/s, on the assumption of an average open trench length of 30 m. At worst, this comprises 0.25% of the *available* allocation for the aquifer, further noting that the dewatering is not consumptive, and would either be discharged back to ground or to the Kawarau River following suitable treatment. Based on information

[46] GHD (2026) *Shotover WWTP – Surface Water and Groundwater Assessment*

Matter for consideration/discretion	Assessment
	provided by GHD (2026), the groundwater hydraulic gradient is in a southerly to easterly direction, towards the Kimi-ākau/Shotover or Kawarau Rivers. In the potential proposed dewatering locations, it is assumed that the groundwater flow direction would be towards the Kawarau River. On this basis, the take is expected to have an insignificant adverse effect on the aquifer, and the discharge of treated groundwater would be in the same direction as it would naturally flow. The proposal is unlikely to have a significant adverse effect on aquifer vulnerability to compaction, on the basis of the underlying soils (coarse alluvium which is assumed to be relatively resistant to compaction) and the localised, short-term nature of the excavations.
(iv) Whether any part of the take would constitute allocation from any connected perennial surface water body, and the availability of that allocation; and	For most of the pipe alignment, any dewatering would be unlikely to be considered as surface water allocation, on the basis that it is not from a Schedule 2C aquifer and the take is more than 100 m from a surface water body (RPW Rules 6.4.1A(a)&(b). Where excavations are within 100 m of the Kawarau River, however, and dewatering is required, this would likely be considered as surface water allocation. RPW Rule 6.4.1 enables the taking of surface water via defined allocation quantities, except where (i) the take is from the main stem of the Kawarau River. On this basis, there is no anticipated effect on surface water allocation due to the potential dewatering required.
(v) The rate, volume, timing and frequency of groundwater to be taken and used; and	As the design is only at preliminary stage, none of these variables are known at present.
(vi) The proposed methods of take, delivery and application of the groundwater taken; and	Potential dewatering methods, if required, will be developed during the detailed design phase of the project. At this stage, however, it is assumed that dewatering would be undertaken via submersible pump, and discharged to a controlled outlet for treatment prior to draining to land.

Matter for consideration/discretion	Assessment
(vii) The source of groundwater available to be taken; and	Shotover Alluvial Ribbon Aquifer ("draft" status under the RPW)
(viii) The location of the use of the groundwater, when it will be taken out of a local catchment; and	Non-consumptive use. Will be discharged within the same catchment it was taken from.
(x) The consent being exercised or suspended in accordance with any Council approved rationing regime; and	As this is a compulsory, temporary non-consumptive take required to enable critical public infrastructure, there should be no restrictions imposed on the water permit being sought.
(xi) Any adverse effect on the existing quality of groundwater in the aquifer; and	Provided best practice is followed in accordance with industry standards for dewatering (such as GD05 recommendations, for example – see Section 2.6.5) and associated discharge of treated abstracted groundwater, no significant adverse effects on the quality of groundwater in the aquifer are anticipated.
(xiii) Any actual or potential effects on any surface water body; and	While the underlying aquifer is hydraulically connected to the Kimi-ākau/Shotover River, the insignificant assumed (worst case) rate and volume of take is unlikely to result in any material effect on Kimi-ākau/Shotover River flows – particularly considering the take is non-consumptive. In terms of surface water quality, any risk of dirty water migrating to the Kawarau River due to dewatering will be minimised by following GD05 guidelines and other industry best practice for dewatering. No direct discharge of dewatered groundwater to surface water is permitted, as part of the proposed works.
(xvii)Any adverse effect on any lawful take of water, if consent is granted, including potential bore interference; and	Given the assumed insignificant quantity of water that will be taken for dewatering, and considering that it will be returned in full to the same aquifer, no adverse effects on any lawful take of water are expected. The nearest bores/wells are owned and operated by the applicant.
(xviii)Whether the taking of water under a water permit should be restricted to	As this is a compulsory, temporary non-consumptive take required to enable critical public infrastructure,

Matter for consideration/discretion	Assessment
allow the exercise of another water permit; and	there should be no restrictions imposed on the water permit being sought.
(xxii)The information, monitoring and metering requirements; and	Existing piezometers in the vicinity of the proposed earthworks can provide detailed monitoring of any effects of dewatering on the aquifer. While adverse effects from dewatering are not expected to be significant, the applicant is open to discussing adoption of monitoring and reporting conditions in relation to dewatering.

Overall, based on the assessment provided in the above table, potential adverse effects on groundwater due to dewatering and temporary earthworks are considered less than minor.

5.6.2 Effects on Surface Water

Works required to construct the pipeline and outfall structure involve ground disturbance, infilling and potentially groundwater dewatering – all of which pose a potential risk to surface water quality if they are not appropriately managed.

Earthworks remove existing vegetation cover and topsoil, exposing the subsoils beneath and greatly increasing the erodibility of the ground. If subjected to rain or wind while in this exposed state, sediment-laden runoff is generated, which can flow into downslope watercourses and impact water quality.

This risk will be managed by developing and implementing a detailed erosion and sediment control plan, an outline of which is provided in Section 2.6.5. Where there is a risk of earthworks-generated sediment-laden runoff entering the Kawarau or Kimi-ākau/Shotover Rivers, sediment control devices, such as silt fencing, will be installed prior to start of works. Where works take place in high-risk locations (such as in close proximity to the river), works will be scheduled to avoid periods of forecasted rain or wind, if practicable to do so. Scheduling will be utilised to ensure that instream works are temporally minimised, and some form of suspended sediment detention device (possible a silt curtain with floating boom) will be installed prior to instream works, to prevent any sediment plume generated from migrating further into the water column. Once work is complete, terrestrial disturbed areas will be successively stabilised by re-spreading topsoil and hydroseeding, potentially with a native seed mix to capitalise on an opportunity to increase indigenous biodiversity.

Management of dewatering works to minimise dewatering discharge risk to surface water is detailed in the previous section. Any dewatered groundwater will be treated to an acceptable standard and discharged to a scour-protected outlet as far from any surface watercourse as possible.

Overall, with the adoption of a suitably-detailed erosion and sediment control plan prior to start of works, and given the recommended mitigations specified above, temporary adverse effects on surface water due to the pipe and outfall construction works are expected to be:

- Less than minor, for terrestrial works; and
- No more than minor, for instream works.

5.6.3 Effects on Ecosystems

5.6.3.1 Terrestrial ecology

Construction of the wastewater conveyance pipeline involves an approximately 1.3 km alignment and an indicative 8 m wide construction corridor, along with localised "design fill" sections to maintain minimum pipe cover and associated temporary earthworks and access.

Vegetation clearance

The terrestrial vegetation communities within the construction footprint are dominated by exotic and highly modified vegetation types (e.g. crack willow forest/treeland, buddleia scrub/shrubland, lupin and hemlock-dominated herbfields, and disturbed gravelfield (gravel roads/tracks and open areas of river gravels), with only small patches of low-diversity indigenous turf (generally dominated by Sinclair's stonecrop) in depressions within gravelfield near the Kawarau River[47].

The ecological impact assessment concludes that vegetation that may need to be cleared as part of the works is largely of negligible ecological value and therefore results in a very low level of effect. Some areas of gravelfield that support sparse indigenous-dominated turf species will be removed during pipeline trench excavations or over-filling, however the report notes that the extent of removal for this vegetation type is small, and the vegetation type itself (which is modified by vehicle use) is of low ecological value.

Overall, effects on terrestrial ecology due to the proposed pipeline and outfall construction is expected to be less than minor. The Boffa Miskell report states that no effects management is required to manage the clearance of vegetation.

Habitat fragmentation and weed spread

Pipeline trenching and reinstatement will locally fragment existing willow and scrub habitats, but the assessment notes the receiving terrestrial environment is already heavily fragmented by existing infrastructure, flood protection works and tracks, and an

[47] Boffa Miskell Ltd (2026): *Shotover WWTP – Ecological Impact Assessment*

8 m corridor is not expected to create a meaningful barrier to movement for the bird species that use these habitats.

Weed spread risk is present wherever soil and gravel are disturbed, but the ecological assessment identifies that exotic weeds are already widespread and the construction footprint is within an environment already subject to long-standing heavy machinery use; accordingly, the ecological consequences of incremental weed spread are limited. Standard construction hygiene and material sourcing controls remain prudent to avoid transporting weeds (and aquatic pests where machinery moves between wet areas), but overall these effects are assessed as very low in ecological terms given the low ecological value of the habitats disturbed.

To mitigate the risk of weed spread, the applicant is willing to adopt standard conditions concerning cleaning and visually checking machinery and vehicles before and after undertaking temporary works on the delta and particularly in- or near-water works, along with use of approved species for reinstating vegetation in disturbed areas.

Avifauna

Construction noise, vibration and activity have potential to temporarily displace birds using terrestrial habitats adjacent to the proposed conveyance pipeline and river margin habitats near the outfall works area. For common and widespread terrestrial species (e.g. forest and shrubland passerines recorded in the wider designation area), the EcIA considers disturbance and displacement to be temporary, with extensive alternative habitat available locally, resulting in a negligible adverse effect. The EcIA notes that the small size of the riverbank habitat that will be removed/modified due to the proposed outfall in the context of extensive similar habitat in the wider area indicates that adverse effects on bird species that are associated with this habitat are expected to be very low.

The key avifauna sensitivity relates to braided river birds that may nest within the open gravel habitats of the lower Shotover delta and near the Kawarau River margins. The assessment identifies that if works near the outfall footprint occur during the breeding season, there is potential for disturbance or damage to nests of threatened and at-risk braided river birds (including black-fronted tern and black-billed gull, which can form colonies), and that in a worst-case, unmitigated scenario this could result in a high level of effect on low to very high-value ecological receptors. The recommended approach is to avoid the breeding season for works near the outfall where practicable and, where works cannot avoid the breeding season, to implement pre-construction nesting surveys and exclusion zones to avoid or minimise ecological effects.

The applicant has proffered conditions in Appendix O concerning nesting bird management as a key mechanism for mitigating this risk, with the subsequent post-mitigation risk assessed as very low.

5.6.3.2 Aquatic ecology

Construction of the rock outfall requires localised disturbance of the true left bank and wetted riverbed gravels, with the EcIA noting that the works area is already subject to frequent natural disturbance from high flows and existing human disturbance along the margin. With standard erosion and sediment controls implemented, any short-term increase in suspended sediment from works is expected to be localised and short-lived relative to the natural suspended sediment regime influenced by Shotover inflows, and therefore of negligible magnitude and very low ecological effect.

There is potential for fish disturbance, stranding or mortality during any works in wetted areas, but the assessment notes that fish diversity at the outfall location is expected to be low and that fish rescue and relocation (where needed by the final methodology) is standard practice that reduces this risk to negligible levels. At this stage, however, it is not expected that instream works will need to be isolated and undertaken "in the dry" (such as via a cofferdam), meaning the risk of fish stranding is very low.

The rock outfall structure introduces a permanent modification to a small area of bank and nearshore bed habitat through placement of rock and boulder material and creation of a defined outlet channel. The ecological assessment describes the affected habitat at the outfall location as relatively low-value at the margin scale (limited cover elements, mobile substrates, deposited sediment), and indicates that the footprint is small relative to the available adjacent habitat. The associated hydrological assessment notes that the structure occupies a small proportion of channel cross-sectional area (approximately 3.5% at low flow and up to around 7% at higher flows assessed), which supports the conclusion that the structure will not create a meaningful barrier to longitudinal connectivity and that any changes are localised to near-field hydraulics. On that basis, the permanent physical habitat effect is appropriately characterised as very low at the reach and catchment scale.

5.6.3.3 Proposed mitigation and monitoring

Ecological mitigation for construction is primarily focused on avoiding, minimising and managing short-term disturbance effects, particularly in relation to sediment discharge, biosecurity risk, and fauna disturbance.

During construction, standard erosion and sediment control measures will be implemented in accordance with recognised guidelines to minimise sediment mobilisation and downstream transport to the Kawarau River. In the event of any unforeseen sediment or contaminant discharge, an adaptive management response will be undertaken by a suitably qualified ecologist to assess effects and recommend remedial actions where required.

To address biosecurity risks, all machinery and equipment will be cleaned prior to arriving at the site, and prior to leaving the site to prevent the spread of terrestrial weeds. For in-stream works, all machinery, equipment and materials that come into contact

with river water or substrates will be subject to "Check, Clean, Dry" protocols to prevent the spread of aquatic pest species such as didymo and lagarosiphon to other waterbodies.

Construction-related effects on freshwater fauna will be managed through the implementation of fish rescue and relocation procedures where works occur within wetted habitat, subject to the final construction methodology.

Potential effects on indigenous bird species, particularly braided river birds, will be managed through pre-construction surveys where works are undertaken during the breeding season. Where active nests are identified, appropriate exclusion zones and avoidance measures will be implemented.

Overall, these measures are designed to ensure that construction-related ecological effects remain temporary, localised, and appropriately managed to a less than minor level through standard industry practice and adaptive response mechanisms.

5.6.3.4 Overall effects on ecology

The below table summarises the assessed level of ecological effects as presented in the EcIA, for both pre- and post-mitigation scenarios.

Table 28: Summary of the assessment of ecological effects for construction activities (Boffa Miskell, 2026)

Ecological Component	Component / Effect	Ecological value	Overall level of effect	
			Pre-mitigation	Post-mitigation
Terrestrial Vegetation and Habitats	Vegetation clearance	Negligible - Low	Very Low	Very Low
	Habitat fragmentation	Negligible - Low	Very Low	Very Low
	Weed introduction and / or spread	Negligible - Low	Very Low	Very Low
	Spread of weeds to other sites	Negligible – Very High	Low – Very High	Very Low
Avifauna	Habitat loss and modification	Low – Very High	Very Low	Very Low
	Disturbance and displacement	Low – Very High	Very Low to Low	Very Low

	Impacts on nesting birds (terrestrial habitats)	Low	Very Low	Very Low
	Impacts on nesting birds (Kimi-ākau/Shotover River and Kawarau River margins and delta)	Low – Very High	Low - High	Very Low
Kawarau River	Bed and bank disturbance	High	Very Low	Very Low
	Fish injury / mortality	High	Very Low – Low	Very Low
	Sediment release	High	Very Low	Very Low

Those activities that have been highlighted as having the potential for high ecological effects (spread of weeds to terrestrial and aquatic habitats, impacts on nesting birds) can be suitably managed via the mitigations proposed in Section 5.6.3.3. On this basis, and given the conclusions made in the EcIA, overall adverse effects on ecology due to the proposed riverbed works are expected to be less than minor.

5.6.4 Construction-related effects on Natural Character and Amenity

The attached LNCA Report (Appendix D) demonstrates that construction of the wastewater conveyance pipeline and outfall will result in temporary adverse effects on landscape character, natural character and visual amenity, primarily arising from earthworks, vegetation disturbance, and the presence of machinery and construction activity within the river margin and adjacent floodplain.

The works involve trenching, excavation, and reinstatement along the pipeline corridor, together with localised earthworks within the river margin and wetted bed to construct the outfall structure. These activities will temporarily modify existing landform patterns, surface conditions and vegetation cover. While the majority of the pipeline will be buried and reinstated, construction will temporarily alter the existing topography and ground condition, resulting in a temporary disturbance to landscape character and natural character attributes.

Within and adjacent to the wetted riverbed, construction activities have the potential to generate short-term sediment mobilisation and localised water quality effects, as well as disturbance to aquatic habitat. However, the report concludes that, with appropriate erosion and sediment control measures, these effects will be small in scale, short-lived, and comparable to natural sediment dynamics within the river system, resulting in very low adverse effects.

Construction activity will also give rise to temporary amenity (experiential and visual effects), including visible earthworks, machinery, noise, and partial restriction of access.

These effects are most pronounced for receptors in close proximity to the works (generally within 50–100 m), where naturalness, amenity and the perceived coherence of the river margin environment will be temporarily reduced. At this local scale, construction effects are assessed as moderately adverse but short-term, diminishing rapidly with distance and after completion of the works.

In relation to natural character, construction results in moderate to high experiential adverse effects within the immediate vicinity of the activity, reflecting the presence of machinery and disruption to river processes. However, these effects are spatially confined and temporary, with effects reducing to low or negligible within the wider delta area due to the scale, dynamism, and high activity of the river system.

Overall, construction-related effects are characterised as:

- Moderate, spatially-confined and temporary during the construction period; and
- Very low to negligible at the wider reach and landscape scale, with rapid recovery following reinstatement.

Taking both scales into consideration, the potential adverse effects of construction and or maintenance of the discharge infrastructure on or adjacent to the riverbed are no more than minor.

5.6.5 Effects on Recreation and Commercial Use

The construction, operation and maintenance of the effluent conveyance pipeline and outfall structure have the potential to result in localised adverse effects on recreation and commercial use, primarily within the Shotover Delta and immediate margins of the Kawarau River.

During construction, temporary effects are expected to arise from works within the riverbed and adjoining access areas, including disturbance associated with pipeline installation, outfall construction and associated earthworks. The Recreation Assessment identifies that this area functions as an access node for both public and commercial recreation, including jet boating, kayaking, angling and use of the Twin Rivers Trail, and that maintaining access during construction is critical to avoid disruption to these activities.

Temporary restrictions to access routes (including Shotover Delta Road and the trail corridor) and to river margin launch areas may therefore result in short-term displacement or inconvenience for users, including commercial operators reliant on predictable access logistics. The assessment also identifies the potential for temporary loss or modification of small, high-use recreation sites, including beaches and river margins used for angling and launching vessels.

Construction activities within the river margin have the potential to introduce short-term amenity effects, including visual disturbance, activity, and localised environmental

change, which may reduce the quality of the recreation experience in the immediate vicinity. However, these effects are temporary and spatially limited, and the report anticipates that recreation use would continue outside the immediate works area, with effects limited to short-term displacement rather than loss of recreation opportunity.

In the operational phase, the physical presence of the outfall structure will result in a small permanent modification to the riverbed and margin, including the replacement of a limited area of existing substrate and (according to Fish & Game) potential loss of a small beach used for angling. The Fish & Game interviewee also raised concerns that anglers may attempt to fish from any new structure (i.e. the rock outfall) if it provides flow refuge for fish, potentially creating safety and management issues. However, the assessment confirms that the design does not inhibit access to the majority of the study area and does not interfere with secondary contact recreation activities such as jet boating and kayaking.

Recommended mitigation for temporary works and the physical structure on the riverbed include notification to recreation groups of temporary exclusion zones during construction, signage at the outfall area, and maintained access to the delta and Twin Rivers Trail throughout the construction phase.

Overall, adverse effects from the temporary riverbed works and physical discharge infrastructure on recreation and commercial use of both the Kawarau River and associated terrestrial margins are considered to no more than minor, provided recommended mitigations are implemented.

5.6.6 Alluvium extraction effects

While most of the matters for council discretion under Rule 13.5.2.1 have already been addressed in the above assessment, a brief assessment of effects against the matters for discretion under this rule is provided in the following table.

Table 29: Assessment against council matters for discretion under RPW Rule 13.5.2.1

Matter for consideration/discretion	Assessment
(a) Any adverse effects of the activity on: *(i) Any natural and human use value identified in Schedule 1 for any affected water body;* *(ii) The natural character of any affected water body;* *(iii) Any amenity value supported by any affected water body; and*	i. Potential localised effects on Kawarau River gravel bed. Potential introduction of aquatic pests. Potential localised removal of eel, kōaro and salmonid habitat. Localised and temporary effects on recreational values, particularly kayaking, jet boating and rafting. ii. Localised and temporary adverse effects on natural character around the outfall and lower conveyance pipeline.

Matter for consideration/discretion	Assessment
(iv) Any heritage value associated with any affected water body; and	iii. Localised and temporary disruption to recreational users of the delta and the Kawarau River in the vicinity of the outfall. iv. Unlikely to measurably impact gold mining heritage values associated with the Kawarau River. Most of the above effects are outside the scope of the specific rule, which concerns alluvium extraction. The key potential effects from this will be release of sediment into the water column (mitigated via ESCP), potential adverse effects on fish habitat due to suspended sediment release (mitigated via ESCP), and temporary disruption to recreation in the general vicinity of the works. In terms of natural character, potential adverse effects are assessed in Section 5.6.5 as moderate, spatially-confined and temporary during the construction period. When assessed in the wider context of the reach/landscape scale, effects are assessed as very low to negligible. This is supported by existing regular activities and uses of the delta, which include gravel extraction, motorbiking and four wheel driving – all of which are disruptive.
(d) Any adverse effect on a defence against water; and	GHD has undertaken a basic geotechnical analysis of the proposed works in relation to the form and function of the training line, and have provided the following summary: *Based on our understanding of the ground conditions…and the nature of the works, we consider that the pipeline installation is unlikely to have a material impact on the overall performance of the stopbank, provided it is appropriately designed and constructed.* *It is important, however, that the design of the pipeline explicitly considers the performance requirements of the stopbank. This should include maintaining the integrity of the stopbank geometry, avoiding creation of preferential seepage paths, and ensuring any excavations, bedding, and backfill are appropriately detailed and controlled. With these considerations incorporated into the design*

Matter for consideration/discretion	Assessment
	(during subsequent design phases), we do not anticipate adverse effects on the stopbank.
(e) The quantity of alluvium to be extracted, and the location and the method of removal; and	Extraction quantities for the pipeline and outfall are provided in Table 11, noting that these are preliminary estimates. Earthworks areas are shown in the attached civil drawings (Appendix K), while the method of removal will be determined during detailed design – likely excavator and rigid dump truck.
(f) Any adverse effect on existing public access; and	Public access will be restricted around the earthworks areas for the pipeline and outfall during construction (and there will be ongoing signage at the outfall but no physical restriction). The recreation report notes that this has the potential to disrupt continuity of public trails, and constrain access routes to preferred shoreline angling locations and informal boat launching sites. To mitigate this effect, the report recommends the following: *…construction management will need to maintain continuous or clearly signposted alternative trail connections, manage short-duration closures outside peak use periods where practicable, and provide maintained access points to the river margin for anglers and boat users wherever safety allows.*
(g) The duration of the resource consent; and	See Section 2.10
(h) The information and monitoring requirements; and	Given the earthworks/extraction activity is highly localised and temporary, it is expected that there will be no information or monitoring requirements for this aspect of the project, other than compliance reporting and/or inspections. Standard consent conditions should address the latter.
(i) Any existing lawful activity associated with any affected water body;	As per Section 3.11, there is the potential to affect downstream water supplies. Provided suspended sediment is adequately managed during in- and near-water works, however, adverse effects on these supplies is considered highly unlikely,

Matter for consideration/discretion	Assessment
	particularly given the intervening distances. Commercial operators on the Kawarau River may be temporarily impacted, however this impact is highly localised and for a very limited duration.

Overall, based on the assessments provided above, the extraction of alluvium in relation to proposed effluent pipeline and outfall construction is expected to have no more than minor adverse effects on the matters for council discretion.

6. Proposed Consent Conditions

To support a full understanding of the activities for which consent is sought, a suite of proposed conditions have been developed and are included in Appendix O.

7. Statutory Considerations

Schedule 4 of the RMA requires that an assessment of the activity against the matters set out in Part 2 and any relevant provisions of a document referred to in Section 104 of the RMA is provided when applying for a resource consent for any activity. These matters are assessed as follows.

7.1 Part 2 of the RMA

7.1.1 Section 5 – Purpose of the RMA

Section 5 requires the sustainable management of natural and physical resources, enabling people and communities to provide for their social, economic and cultural wellbeing while safeguarding life-supporting capacity and avoiding, remedying or mitigating adverse effects.

The proposal provides for the ongoing treatment and disposal of wastewater generated within the Wakatipu Basin, which is essential infrastructure supporting public health, environmental protection, and urban development. The assessment identifies that the WWTP currently services a substantial and growing population (approximately 50,000 people in 2024, with growth anticipated) and produces significant volumes of treated wastewater requiring reliable disposal.

The proposal represents a transition from a constrained and non-performing land-based disposal system (DAD) to a long-term, fit-for-purpose discharge solution. The evidence demonstrates that the DAD system is no longer viable due to hydrogeological limitations, including shallow groundwater and limited infiltration capacity, and has led to adverse effects such as ponding and groundwater quality degradation.

In this context, the proposed discharge to the Kawarau River, coupled with enhanced treatment (tertiary filtration, UV disinfection, and phosphorus removal), supports sustainable management by:

- maintaining essential wastewater services for the community;
- improving treatment performance and reducing contaminant loads relative to historic discharges; and
- providing a reliable, long-term solution capable of accommodating projected growth.

Adverse effects on the receiving environment (including surface water quality, ecology, recreation and cultural values) are acknowledged and assessed in detail in Section 5. While some effects are adverse (particularly cultural effects from discharge to water), the proposal incorporates mitigation measures, including improved treatment and optimised outfall design to enhance dilution and mixing.

Overall, the proposal is considered to promote the sustainable management purpose in s 5, recognising that complete avoidance of effects (particularly cultural effects) is not practicable given the scale and constraints identified through the alternatives assessment.

7.1.2 Section 6 – Matters of National Importance

The proposal engages several matters of national importance, particularly:

s6(a) – Preservation of natural character of rivers and margins

The discharge to the Kawarau River and associated outfall works have the potential to affect natural character. However:

- the receiving environment is already modified by flood protection works, infrastructure and existing WWTP operations; and
- effects are mitigated through treatment improvements and outfall design to reduce visible and water quality impacts.

Accordingly, while there will be some minor change to natural character, the LNCA confirms that overall effects on natural character are no more than minor, with the proposal avoiding significant adverse effects and appropriately mitigating other effects.

s6(c) – Protection of indigenous vegetation and habitats

Ecological effects are assessed in detail in the EcIA (Appendix B). The EcIA indicates that terrestrial ecological values within the works area are generally low, with vegetation dominated by introduced species.

Potential effects on aquatic ecosystems are managed through improved effluent quality and dilution. On this basis, more than minor adverse effects on indigenous habitats are unlikely.

s6(d) – Maintenance and enhancement of public access

Public access to rivers is maintained. Temporary disruption during construction will be addressed through management measures (e.g. alternative access routes), and long-term access is not materially reduced.

s6(e) – Relationship of Māori with water and taonga

This is the most significant Part 2 matter for the proposal. The AEE acknowledges that Kāi Tahu rūnaka do not support discharge of treated wastewater to water, reflecting fundamental cultural concerns regarding the mixing of treated wastewater with natural water bodies.

A full assessment of alternatives confirms that land-based disposal is the culturally preferred option but is not feasible at the required scale due to physical, logistical, and cost constraints.

While the proposal includes mitigation (including treatment improvements), it does not remove the core cultural concern. Accordingly:

- significant adverse effects on cultural values are acknowledged;
- these effects cannot currently be avoided; and
- the proposal instead seeks to minimise them while enabling essential community infrastructure.

This creates a clear tension within s6(e), which must be weighed alongside s5 and other Part 2 matters.

7.1.3 Section 7 – Other Matters

Relevant s7 considerations include:

s7(a) Kaitiakitanga

The proposal partially recognises kaitiakitanga through engagement with rūnaka and consideration of land-based options; however, it does not achieve outcomes sought by mana whenua due to the continued discharge to water.

s7(aa) Ethic of stewardship

The proposal reflects the ethic of stewardship by transitioning from a failing disposal system to a more robust long-term solution with improved treatment, monitoring and adaptive management to minimise environmental risk over time.

s7(b) Efficient use of resources

The proposal represents efficient use of existing infrastructure by building on recent WWTP upgrades (including Stage 3 treatment improvements) rather than requiring large-scale relocation or new treatment systems.

s7(c) & s7(f) Maintenance and enhancement of amenity values and environmental quality

Enhanced treatment (tertiary filtration, UV, phosphorus removal) will reduce contaminant concentrations and improve environmental outcomes compared to historic discharges and the failed DAD system.

s7(d) Intrinsic values of ecosystems

Ecological effects are managed through maintaining water quality within acceptable limits and minimising localised effects through discharge/treatment design and dilution.

s7(i) Effects of climate change

The proposal supports adaptation to growth-related pressures on wastewater systems (including with a robust outfall structure), although specific climate change considerations are more indirectly addressed through long-term infrastructure planning.

s(h) Habitat of trout and salmon

The proposal recognises the importance of maintaining habitat for trout and salmon in the Kawarau River, with effects managed through improved effluent quality, discharge design and dilution to minimise adverse effects on aquatic habitat.

7.1.4 Section 8 – Treaty of Waitangi

Section 8 requires that the principles of the Treaty of Waitangi be taken into account.

The assessment demonstrates that:

- mana whenua have been engaged throughout the alternatives assessment process; and
- their preferences (particularly for land-based disposal) are clearly documented.

However, the selected option is not supported by Kāi Tahu due to the continued discharge to water.

The proposal therefore reflects procedural recognition of Treaty principles, but only partial substantive alignment, as the outcome does not give effect to mana whenua aspirations. However, conditions have been proposed to include Kāi Tahu in the construction and operational processes should it choose to do so.

7.1.5 Overall Part 2 Conclusion

Overall, the proposal raises a clear tension under Part 2:

- It strongly supports s5 by enabling essential infrastructure, protecting public health, and providing a long-term, reliable wastewater management solution.

- It gives appropriate weight to s6(a), (c), and (d), with effects managed and mitigated to acceptable levels.
- However, given the absence of feasible alternatives and the need to provide essential community infrastructure, it gives limited effect to s6(e) and Treaty principles in a substantive sense, due to the unavoidable cultural effects associated with discharge to water.

Having regard to the comprehensive alternatives assessment, which demonstrates that no feasible, practicable and cost-effective land-based solution exists, the proposal represents the most appropriate means of achieving the purpose of the Act in this context, while acknowledging that cultural effects remain a significant residual matter.

7.2 Section 104(1)(b) of the RMA

Section 104(1)(b) requires the consent authority to have regard to any relevant provisions of the following:

i. a national environmental standard;

ii. a wastewater environmental performance standard:

iii. other regulations;

iv. a national policy statement;

v. a regional policy statement or proposed regional policy statement;

vi. a plan or proposed plan.

An assessment of the relevant statutory documents that corresponds with the scale and significance of the effects that the proposed activity may have on the environment is provided below.

7.2.1 National Environmental Standards (NES)

As outlined in sections 4.2 to 4.4 above, there are no NES that trigger a consent and therefore no further assessment of these has been undertaken.

7.2.2 Water Services (Wastewater Environmental Performance Standards) Regulations 2025 (WEPS)

The WEPS[48] came into effect in part on 19 December 2025 and establish national minimum environmental thresholds for discharges of wastewater to land and water. Overall, the WEPS introduce additional requirements for long-term consenting, particularly around considering existing river water quality, achievement of higher rates

[48] Relevant to section 104 assessments under section 104(1)(b)(ia).

of dilution for discharges to the Kawarau River and the corresponding implications this has on treatment requirements.

In this case, the WEPS do not apply to the proposal due to the "pristine water" exception[49], which applies when the receiving environment meets the National Policy Statement for Freshwater Management (NPS-FM) Appendix 2A Band A attributes. As it is Regional Council's responsibility under the NPS-FM to determine a river's attribute status, confirmation has been sought from ORC as to the status of the Kawarau River. ORC have confirmed[50] that the Kawarau River is expected to meet the Band A status for all attributes other than sediment which is naturally high and that they agree that the Kawarau River meets the "pristine water" exception and therefore the WEPS do not apply to the proposal.

However, although the WEPS do not apply to the proposal, they are included in the table below alongside the proposed consent limits for this application as a useful point of reference for the assessment of the proposal's environmental effects and how the applicant intends to manage those effects. Notably, all the proposed limits for this application are predominately the same or less than those required across the moderate dilution and hard bottomed river categories within the WEPS, noting that while the TAN proposed limit appears different, the proposed consent limit is for the 95%ile while the WEPS applies to the 90%ile so they are slightly different statistics and likely to represent similar quality effluent.

Table 30: WEPS limits for moderate dilution river discharges and hard bottomed rivers compared to the consent limits proposed

	WEPS limits for river discharges			Proposed consent limit	
Parameter	Unit/statistic	Moderate dilution	Low risk periphyton	Unit/statistic	
cBOD5 (mg/L)	Annual median	15	-	Annual median	5
	90%ile	30	-	95%ile	10
TSS (mg/L)	Annual median	15	-	Annual median	5
	90%ile	30	-	95%ile	10
TN (mg/L)	Annual median	10	10	Annual median	10
TP (mg/L)	Annual median	5	3	Annual median	1.5
TAN (mg/L)	90%ile	3	3	95%ile	5
E.coli (cfu/100mL)	90%ile	3,250	-	95%ile	100

[49] WEPS 2025, Part 3 regulation 43 (g) General exceptions for discharging treated wastewater

[50] ORC memo on Kawarau water quality status (refer Appendix P)

7.2.3 Water Conservation Order

The WCO recognises and protects outstanding values attributed to the Kawarau River and its key tributaries, including the reach of the Kimi-ākau/Shotover River proximal to the existing and proposed treated wastewater discharges. Any discharge or land-use change that could degrade the Kawarau or Kimi-ākau/Shotover River's outstanding characteristics will be assessed against the WCO protections. The Kawarau WCO, as it relates to the reaches of the Kawarau River and Kimi-ākau/Shotover River relevant to this application, focuses primarily on protecting the amenity and intrinsic values of those Rivers because they are considered outstanding (WCO, clause (4)(1)). The specific outstanding characteristics of the Kawarau River to be protected[51] are as follows (Schedule 2 Kawarau WCO):

- *wild and scenic characteristics;*
- *natural characteristics, in particular the return flow in the upper section when the Shotover River is in high flood;*
- *scientific values, in particular the return flow in the upper section when the Shotover River is in high flood;*
- *recreational purposes, in particular rafting, jetboating, and kayaking.*

Schedule 2 of the Kawarau WCO contains prohibitions and restrictions, including (for the Kawarau and Kimi-ākau/Shotover Rivers) that there is "no damming allowed" (not relevant to this application) and that "water quality is managed to Class CR standard". This means maintaining contact recreation quality, specifically bathing. Schedule 3(5) of the RMA[52] states that water being managed for contact recreation purposes means that:

(1) The visual clarity of the water shall not be so low as to be unsuitable for bathing.

(2) The water shall not be rendered unsuitable for bathing by the presence of contaminants.

(3) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

Schedule 3 of the RMA also makes it clear that the standards listed for each class apply "after reasonable mixing of any contaminant or water with the receiving water and disregard the effect of any natural peturbations that may affect the water body."

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[51] Noting that the Kawarau and Kimi-ākau/Shotover Rivers fall within Schedule 2 which recognises waters that are no longer in their natural state, but which have values warranting protection

[52] Schedule 2 of the WCO states that "References to classes are Water quality classes as in Schedule 3 of the [RMA]."

Section 217 of the RMA, states that a consent cannot be granted for an activity:

- that would be contrary to any restriction or prohibition or any other provision in a water conservation order; or
- if the provisions of the water conservation order cannot remain (combined with the effect of the consent) without change.

This means that a consent can only be granted if the water quality restrictions of Class CR are met after reasonable mixing, and as long as the outstanding amenity and intrinsic values of the WCO can be sustained and the Schedule 2 characteristics can be protected.

Class CR water quality standard

The technical reports indicate that the proposal achieves compliance with Class CR standards after reasonable mixing. The water quality assessment concludes that, following dilution and mixing downstream of the discharge point:

- water quality is predicted to be suitable for bathing, consistent with CR requirements;
- public health risk is assessed as low relative to accepted thresholds; and
- contaminant concentrations are substantially reduced from near-field levels, with key parameters returning to acceptable levels, and no undesirable biological growths expected to arise as a result of the discharge.

While some localised and short-term departures from background conditions occur within the immediate mixing zone, these are spatially confined and rapidly attenuate, such that the WCO requirement to achieve Class CR standards after reasonable mixing is met overall.

Outstanding amenity and intrinsic values

In relation to the protection of the WCO's identified outstanding values, the technical reports consistently conclude that effects are localised and generally negligible to no more than minor at the broader reach scale, with no material degradation of the characteristics identified in the Order.

- Wild and scenic characteristics:
  The landscape and natural character assessment concludes that the proposal will result in low and localised adverse effects, with the outfall structure small in scale and integrated into an already modified river margin. The wider river corridor retains its dominant natural features, and cumulative landscape effects are assessed as less than minor, meaning the overall wild and scenic qualities are maintained.
- Natural and scientific characteristics (including return flow at high flows):
  The hydrology and water quality assessments indicate the discharge structure

will not materially alter river processes, with no measurable damming, flow obstruction, or influence on return flow characteristics, including under high-flow conditions. The small scale of the outfall relative to river size and channel dynamics supports the conclusion that these intrinsic characteristics will be protected.

- Scientific values (including hydrological processes):
  The GHD WQ Report and EcIA demonstrate that key system processes – including mixing behaviour, sediment transport, and ecological function – remain substantially unchanged. Ecological effects are assessed as less than minor beyond the near-field mixing area, reflecting the high-energy, mobile nature of the Kawarau River and its limited sensitivity to the scale of the proposed discharge.
- Recreational purposes (rafting, jetboating, kayaking):
  The recreation assessment confirms that the Kawarau–Shotover corridor supports high-intensity recreational use, and that maintaining water quality suitable for contact recreation is critical to these activities. The proposal is assessed as maintaining this outcome at the relevant scale, with:
    - water quality suitable for contact maintained both within and after reasonable mixing (supporting direct interaction through spray, immersion and boating);
    - no material constraints on navigation or river use arising from the outfall; and
    - effects on recreation values negligible beyond the near-field of the discharge, with the wider river experience preserved.

However, the recreation report identifies that perceptual effects — including the visibility of the discharge, associated signage, and awareness of wastewater inputs — may influence user experience in the immediate vicinity of the outfall. These effects are localised and relate to recreational amenity rather than measurable water quality or health risk, and while they may deter some users from the near-field area, they do not extend to the wider river system or undermine the maintenance of recreation values recognised by the WCO.

Overall conclusion

Overall, the proposal is consistent with the requirements of the WCO, in that:

- Class CR water quality standards are predicted to be met after reasonable mixing, consistent with the Order's requirements; and
- the identified outstanding amenity and intrinsic values are protected at the scale intended by the WCO, with adverse effects assessed as localised and not materially diminishing those values.

The principal qualification to this conclusion relates to:

- localised near-field effects within the mixing zone, and
- potential perception effects on recreation users,

which may affect experience at a very local scale but do not undermine the overarching protection of the Kawarau River's outstanding characteristics as required by the WCO.

Therefore, there is no restriction on granting this consent application under Section 217.

7.2.4 National Policy Statements

7.2.4.1 National Policy Statement for Freshwater Management 2020

The National Policy Statement for Freshwater Management 2020 (NPSFM) came into force on 3 September 2020 and provides direction to local authorities on managing freshwater under the RMA.

Te Mana o te Wai is the fundamental concept underpinning freshwater management in New Zealand, that recognises that *protecting the health of freshwater protects the health and well-being of the wider environment… Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.* Te Mana o Te Wai framework incorporates the following six principles:

(a) *Mana whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater*

(b) *Kaitiakitanga: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations*

(c) *Manaakitanga: the process by which tangata whenua show respect, generosity, and care for freshwater and for others*

(d) *Governance: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future*

(e) *Stewardship: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations*

(f) *Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.*

The Objective of the NPS-FM is to ensure that natural and physical resources are managed in a way that prioritises first, the health and well-being of waterbodies and freshwater ecosystems, second, the health needs of people (such as drinking water), and third, the ability of people and communities to provide for their social, economic,

and cultural well-being, now and in the future (i.e., the hierarchy of obligations in Te Mana o te Wai).

The RMA was amended in October 2024 (s104(2F)) to specify that when considering a resource consent application and any submissions received "…a consent authority must not have regard to clause 1.3(5) or 2.1 of the NPSFM 2020 (which relates to the hierarchy of obligations in the NPSFM 2020)." However, other parts of the NPSFM 2020 (including Policy 1 under section 2.2 (Policies)), where relevant to the application, must still be included in an assessment of a consent application pursuant to Schedule 4, clause 2(2)(a).

The relevant policies of the NPSFM are assessed below.

***Policy 1**: Freshwater is managed in a way that gives effect to Te Mana o te Wai.*

The GHD WQ report concludes that the proposed treatment upgrades will produce a net improvement in discharge quality and that, after reasonable mixing, effects on key water-quality parameters (including nitrogen, dissolved oxygen, colour and clarity) will be negligible to no more than minor, with overall effects "no more than minor". The EcIA similarly applies the NPS-FM National Objectives Framework (NOF) attribute framework and predicts that, beyond the near-field mixing area, most parameters align with high receiving-water quality outcomes (e.g., nitrogen generally within A attribute bands after mixing), supporting the conclusion that freshwater ecosystem health is maintained within the receiving environment. This aspect aligns with Te Mana o te Wai in the sense that maintaining very good water quality and avoiding material degradation supports the health of freshwater and associated ecosystems.

Notwithstanding that, the proposal is not fully consistent with Policy 1 because the cultural and spiritual dimensions of Te Mana o te Wai are not protected where mana whenua consider the direct discharge of human effluent to water to be inherently inconsistent with mauri. The cultural position statement (Appendix H) is explicit that direct discharge of human waste to natural water is "abhorrent" almost regardless of treatment, and that wastewater (wai-kino/tapu) should instead pass through land (Papatūānuku) to restore mauri and reach a state of noa. The CIA prepared for the emergency discharge application likewise identifies adverse effects linked to kaitiakitanga, mauri, ki uta ki tai and mahinga kai. The options selection process (see section 1.2) sets out the robust process applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Combination of to land and to water options were also assessed and ultimately, sole discharge to land options were not assessed as feasible.

Overall, while the discharge will not result in any more than minor physical effect on the wai it will not protect the metaphysical mauri of the wai. But it does provide a balance

between the water, the wider environment and the community in terms of providing a critical lifeline infrastructure function in a manner that is affordable and cost-effective to the community.

***Policy 2**: Tangata Whenua are actively involved in freshwater management (including decision making processes) and Māori freshwater values are identified and provided for.*

The optioneering process for the long-term disposal solutions actively involved Ngāi Tahu ki Murihiku, through Te Ao Mārama Inc. and Aukaha, in identifying cultural values, effects, and mitigation pathways, including kaitiakitaka, mauri, ki uta ki tai, and mahika kai.

However, there is fundamental tension between the proposal and key Māori freshwater values, particularly in relation to the direct discharge of treated wastewater to water. The direct discharge of human waste to water is considered culturally unacceptable (wai-kino mixing with other waters), with a strong preference for land-based treatment to restore mauri. Accordingly, while the proposal demonstrates engagement with tangata whenua and incorporation of cultural values into the assessment of options and in proposed conditions, and mitigation, it does not fully provide for Kāi Tahu freshwater values.

***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.*

The supporting assessments adopt a catchment-scale approach, explicitly evaluating the interaction between the Kimi-ākau/Shotover River, Kawarau River, and wider hydrological system, including groundwater, surface water, and downstream receiving environments. The proposal considers the cumulative effects of land-based wastewater treatment, historic discharge practices, and future growth, as well as the mixing, dilution, and transport of contaminants through the river system, demonstrating alignment with the policy's requirement to assess effects beyond the immediate discharge point and across connected water bodies.

***Policy 5**: Freshwater is to be managed through a National Objectives Framework to ensure that the health and wellbeing of degraded water bodies and freshwater ecosystems is improved.*

The current water quality of the Kawarau River is not in a degraded state so is not required to be further improved under the NPS-FM direction. The proposal adopts an effects-based approach aligned with the NOF to maintain or improve freshwater health. The technical assessments apply NPS-FM attribute bands as a primary benchmark for predicted water quality outcomes, with modelling indicating that key parameters such as nitrogen species are maintained within Attribute Band A after reasonable and complete mixing, reflecting very good water quality and low ecotoxicity risk.

In terms of improving degraded freshwater environments at a localised reach rather than Freshwater Management Unit (FMU) scale, the proposal also represents a shift toward a higher-quality, fully treated discharge with tertiary filtration and enhanced UV disinfection, which is predicted to result in a net improvement in water quality relative to existing conditions. While some localised exceedances of the A-band state (e.g. dissolved reactive phosphorus within the mixing zone) may occur, overall effects beyond the immediate discharge area are assessed as no more than minor to negligible, with water quality returning to baseline conditions after complete mixing. Accordingly, the proposal is consistent with Policy 5 as it supports maintaining high water quality and improving conditions where they have been historically degraded

Policy 7: *The loss of river extent and values is avoided to the extent practicable.*

This policy requires the loss of river extent and values to be avoided to the extent practicable and the proposal is broadly consistent with it. The physical footprint of the proposal within the river is limited to a localised outfall structure extending approximately 10 m into the channel, resulting in only a small reduction in river cross-sectional area (approximately 3.5% at low flow and up to ~7% at higher flows), with hydrological effects assessed as less than minor. These findings indicate that the proposal avoids material loss of river extent and does not meaningfully alter channel form or function beyond a confined area, consistent with the policy's directive to avoid loss where practicable.

In relation to river values, including ecological, recreational, and natural character values, the proposal has been designed to avoid degradation beyond the near-field mixing area (and for public health within the near-field mixing area), with modelling and technical assessments indicating that water quality, ecological conditions, and recreation values are maintained after reasonable mixing (including cumulative effects), and that overall effects are no more than minor to negligible. Nevertheless, there remains some degree of localised modification within the active channel (e.g. introduction of rock armouring and outfall structure/pipe), which results in no more than minor changes to natural character and scientific values (in particular the return flow in the upper section when the Shotover River is in full flood) in the immediate vicinity , albeit confined and mitigatable through design and planting. On that basis, while some limited adverse effects on river values cannot be entirely avoided, the design and scale of the proposal demonstrate that loss of extent and values has been avoided to the extent reasonably practicable, consistent with Policy 7.

Policy 8*: The significant values of outstanding water bodies are protected.*

The Kimi-ākau/Shotover and Kawarau Rivers are recognised as water bodies containing outstanding characteristics which must be protected through the Kawarau WCO as well as regional planning instruments. The proposed discharge has been specifically assessed against this regulatory framework, which affords the highest level of protection

to its natural, cultural, scientific and recreational values. The technical assessments indicate that, following treatment upgrades and mixing, water quality will be maintained at a high level (predominantly NPS-FM Attribute Band A) and will continue to provide for recreation and intrinsic values, consistent with the requirement to protect the values of outstanding water bodies. In addition, the discharge design (including outfall placement and enhanced treatment) seeks to minimise direct exposure and avoid degradation of key values in the Kawarau River such as scientific values, natural and scenic characteristics, and recreation, which are explicitly identified as outstanding characteristics of the Kawarau River system

However, while overall water quality outcomes will be maintained beyond the near-field mixing area, there will be localised effects within the near-field mixing area, including temporary exceedances of some parameters (e.g. nutrients or metals) and the introduction of a physical outfall structure within the river margin. These effects are assessed as no more than minor and spatially confined, and do not materially compromise the broader river values after reasonable mixing, but they nevertheless represent some modification within an outstanding water body. On that basis, the proposal is broadly consistent with Policy 8 to the extent that it maintains and protects the significant values of the Kawarau River at a catchment and downstream scale, with appropriate mitigation proposed to manage localised effects rather than fully avoiding all impacts at the point of discharge.

***Policy 9**: The habitats of indigenous freshwater species are protected.*

The proposed discharge is generally consistent with Policy 9 of the NPS-FM, which requires protection of indigenous freshwater species and their habitats. Ecological assessments identify the Kawarau River as supporting a diverse range of habitats and species, including indigenous fish such as kōaro and longfin eel, as well as nationally significant trout fisheries. The proposal incorporates advanced treatment processes (including tertiary filtration and enhanced UV disinfection) and has been assessed using predictive modelling, which indicates that water quality parameters relevant to ecological health (e.g. nutrients, dissolved oxygen, suspended solids) largely return to background conditions after reasonable mixing, with overall effects on aquatic ecology assessed as less than minor. This supports the conclusion that the broader ecological function and habitat quality of the river are maintained, thereby aligning with Policy 9 at a catchment scale.

However, there remains the potential for some localised effects within the reasonable mixing zone and near-field mixing area of the outfall structure, including temporary increases in certain contaminants and small-scale physical habitat modification associated with construction and placement of the rock outfall. These effects have potential to influence habitat conditions (e.g. substrate, flow, or exposure to contaminants) in the near-field mixing area, although they are spatially limited and can be mitigated through construction management and design measures. On this basis,

while some minor and localised impacts on freshwater habitats cannot be entirely avoided, the proposal is broadly consistent with Policy 9 as it maintains habitat integrity and ecological values beyond the near-field mixing area and avoids significant adverse effects on indigenous freshwater species.

***Policy 10**: The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.*

The Kimi-ākau/Shotover and Kawarau Rivers are recognised sports fishery habitats. The assessment of effects has demonstrated that this discharge activity will not prevent those habitats of trout and salmon from being protected after reasonable mixing of the discharge, as it maintains habitat conditions for trout and salmon. The Kawarau River is recognised as supporting a nationally significant trout fishery and provides habitat for salmonids, and modelling indicates that key water quality parameters and ecological conditions will be maintained after reasonable mixing (aside from phosphorus which will be returned to Band A attribute after complete mixing), with overall effects assessed as no more than minor. While there may be localised and short-term effects within the near-field mixing area and during construction, these are spatially limited and not expected to materially alter habitat availability or quality for salmonids beyond the near-field (~40m area). On that basis, and given that indigenous habitat protection is prioritised, the proposal is considered consistent with Policy 10 insofar as it avoids significant adverse effects on trout and salmon habitat while remaining subordinate to the requirements of Policy 9.

***Policy 12**: The national target (as set out in Appendix 3) for water quality improvement is achieved.*

Appendix 3 of the NPS-FM sets the national target for rivers and lakes to be suitable for primary contact to at least 80% of rivers by 2030 and 90% by 2040, and to generally improve water quality across all categories. The recreation and water quality assessments indicate that, following treatment upgrades and mixing, *E. coli* concentrations and associated human health risks are less than minor or negligible and remain within acceptable criteria for recreational use, with locations in the Kawarau River remaining within the NPS-FM A Band attribute state for *E.Coli*. This demonstrates that the proposal maintains a high standard of water quality consistent with national targets for increasing the proportion of rivers suitable for contact recreation, rather than undermining those outcomes.

***Policy 13**: The condition of water bodies and freshwater ecosystems is systematically monitored over time and action is taken where freshwater is degraded to reverse deteriorating trends.*

The proposed long-term discharge is generally consistent with Policy 13 of the NPS-FM, which requires systematic monitoring of freshwater conditions and adaptive management where degradation occurs. The Shotover WWTP proposal is supported by

an established and ongoing monitoring programme, with multiple monitoring sites in the Kawarau River (including upstream, at the discharge point, and downstream) used to assess water quality and ecological parameters over time, enabling comparison of trends and identification of any changes attributable to the discharge. This structured monitoring framework aligns with the intent of Policy 13 to provide a robust evidence base for tracking freshwater condition and detecting deterioration.

In addition, the proposal incorporates an effects-based management approach, whereby monitoring results informed (and will continue to inform) refinement of treatment performance, design, and consent conditions, including further improvements (e.g. enhanced UV disinfection and tertiary treatment) where required. The modelling and assessment framework also establishes baseline conditions and predicted outcomes against which future monitoring can be evaluated. While the proposal anticipates largely no more than minor effects after reasonable mixing, the monitoring regime ensures that any unforeseen degradation can be identified and addressed through management or regulatory responses, consistent with Policy 13's requirement to take action to reverse deteriorating trends.

***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 proposal supports essential wastewater infrastructure required for servicing the growing Queenstown community, including provision for long-term population growth and reliable wastewater treatment, which is necessary to maintain public health, environmental protection, and economic activity. In addition, the proposal responds to existing infrastructure failures and regulatory requirements (including the enforcement order) by establishing a sustainable long-term discharge solution, thereby supporting community wellbeing in a manner aligned with regulatory expectations.

From a freshwater management perspective, the ability to provide for these wellbeing outcomes is contingent on maintaining the health and values of the receiving environment. The technical assessments indicate that, following treatment upgrades and mixing, water quality, ecological values, and recreation opportunities in the Kawarau River are maintained, with effects assessed as no more than minor to negligible beyond the immediate mixing zone. While the proposal involves some localised environmental effects and there remain significant cultural concerns associated with discharge to water, it incorporates mitigation, monitoring, and design measures to manage these effects within acceptable limits. On that basis, the proposal is consistent with Policy 15, enabling community wellbeing while remaining within the environmental constraints and objectives established by the NPS-FM.

7.2.4.2 National Policy Statement for Infrastructure

A new National Policy Statement for Infrastructure (NPS-I) was introduced as part of the broader resource management reforms and took effect on 15 January 2026. The NPS-I

sets out policies to enable, recognise, and protect new and proposed '*infrastructure*' and '*additional infrastructure*', as defined in the RMA and the NPS-I.

The main objective of the NPS-I is to ensure decision-makers recognise and provide for infrastructure benefits at national, regional, and local levels, so infrastructure can meaningfully contribute to community wellbeing while also ensuring infrastructure is well-functioning, resilient and compatible with other activities and essential services are delivered efficiently and on time, while managing environmental effects appropriately.

Eleven new policies are included and those relevant to this application are assessed below.

Infrastructure benefits are recognised and provided for (Policy 1)

The long-term proposal is strongly aligned with NPS-I Policy 1 because it enables core wastewater infrastructure needed to service the Queenstown/Whakatipu community. This disposal solution is intended to replace the failed DAD disposal field and provide a durable disposal solution to at least 2060, with LTP funding allocated to deliver this essential service. The WWTP is a lifeline utility.

Functional and operational need / locational constraints are recognised (Policy 2)

Policy 2 is relevant because wastewater infrastructure often has an operational and functional need to locate where it can function effectively (a relevant factor when determining operational or functional need under Policy 2(2)(b)). This proposal is anchored to the existing Shotover WWTP location on the Shotover Delta, the discharge option was selected after a robust alternative selection process, and the discharge/outfall location is selected to achieve effective mixing and manage exposure at the river margin. The GHD WQ Report records that river bathymetry and dispersion considerations support discharge about 10 m from the shoreline to improve dispersion, and the concept outfall is designed accordingly. This demonstrates that there is an operational and functional need for the Shotover WWTP discharge to locate in the proposed location and in its proposed form to ensure the operational requirements to achieve dispersion and manage effects are achieved.

Efficient and timely delivery of infrastructure is enabled (Policy 4)

The NPS-I emphasises enabling delivery of infrastructure efficiently and on time. This long-term disposal solution is a replacement for the short-term (emergency) situation and in response to enforcement order requirements and long-term programme timeframes for design and implementation. In addition, the NPS-I is intended to be an enabling national direction for infrastructure outcomes while still requiring appropriate effects management. This context supports giving weight to timely delivery of the long-term infrastructure solution as part of the overall planning judgement.

Māori interests in relation to infrastructure are recognised and provided for (Policy 6)

For the long-term discharge, Policy 6 is a key "tension point": the proposal can demonstrate engagement and recognition of Māori interests through the broader project context and process, but the discharge to water remains a cultural concern. There has been ongoing engagement with mana whenua (via Te Ao Marama Inc and Aukaha), and the optioneering process (see section 1.2) involved Kāi Tahu and recognises cultural values as a key matter. Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. In NPS-I terms, the long-term proposal is consistent with Policy 6 procedurally where engagement outcomes and conditions/management responses genuinely reflect Māori interests—but substantive consistency will depend on further discussion with mana whenua to work through how the long-term solution can respond to the preference for land-based buffering and mauri restoration, and how cultural monitoring/participation can be embedded in consent conditions and operational management.

Effects management is proportionate and reflects infrastructure constraints (Policy 7)

Policy 7 requires decision-makers to consider the extent to which effects have been avoided, remedied, or mitigated through options selection and design, alongside operational constraints. The long-term proposal is supported by a package of treatment upgrades (tertiary filtration and enhanced UV disinfection) intended to reduce contaminants (e.g. suspended solids and pathogens) and improve discharge quality relative to historic/current conditions. The ecological and water quality predictions indicate that, after reasonable mixing, key parameters are expected to largely align with high receiving-water quality states for the Kawarau River (e.g. many parameters predicted in the A attribute band), with effects characterised as no more than minor beyond the near-field mixing area. The proposal also adopts design measures to manage effects at the physical interface (a rock outfall structure and landscaping/planting to integrate the structure and discourage access), which is relevant to proportionate mitigation in a sensitive river margin setting.

Enabling infrastructure in sensitive environments while managing RMA s6 matters (Policy 9)

The long-term discharge is proposed within an environment that includes high statutory and community values (including outstanding water body considerations and recreation/natural character context). The NPS-I anticipates that infrastructure will sometimes need to occur in such environments, but with effects appropriately managed and considered alongside other national direction. The landscape and natural character assessment identifies the site as within an ONL overlay and addresses effects on natural character, landscape and visual values, reflecting the s6(a) and s6(b) context that Policy 9 contemplates must be balanced with enabling infrastructure. The Recreation

assessment identifies high recreation use values in the receiving environment and alongside modelled dilution/mixing patterns, supporting an effects framework that seeks to maintain suitability for recreation after mixing.

Conclusion

The long-term discharge proposal is generally consistent with the enabling intent of the NPS-I, particularly Policies 1, 2, 4, 7 and 9, because it delivers essential wastewater infrastructure, is shaped by operational/locational constraints, and incorporates treatment and design measures to manage environmental effects. The key qualification is Policy 6 (Māori interests): while engagement is recognised as necessary and is occurring, there remains inconsistency with providing for Māori freshwater values in a context where discharge to water is a core cultural concern.

7.2.4.3 National Policy Statement for Indigenous Biodiversity 2023

The National Policy Statement for Indigenous Biodiversity 2023 (NPS-IB) came into force on 4 August 2023 and sets out the objectives and policies for indigenous biodiversity management under the RMA. The overall objective of the NPS-IB is to maintain indigenous biodiversity across New Zealand so that there is 'at least no overall loss in indigenous biodiversity after the commencement date'.

The proposal is generally consistent with the NPS-IB to the extent that it identifies, assesses, and manages effects on indigenous biodiversity using the prescribed effects management hierarchy, while recognising areas of ecological significance and maintaining overall biodiversity values.

At a site and effects level, the EcIA assessment applies the NPS-IB significance criteria and concludes that most of the construction footprint does not comprise significant indigenous vegetation or habitat, while acknowledging that the adjacent Lower Shotover River and delta are ecologically significant under those same criteria. Effects associated with construction and operation are assessed as localised and less than minor, with mitigation measures (e.g. reinstatement, erosion and sediment controls, and design of the outfall) directed toward avoiding, remedying or mitigating adverse effects, consistent with the effects management hierarchy required under the NPS-IB. Post-mitigation effects are assessed as less than minor.

At a policy and outcome level, the NPS-IB seeks to maintain indigenous biodiversity nationally (i.e. no overall loss) while recognising tangata whenua as kaitiaki and enabling social, economic, and cultural wellbeing. The proposal aligns with this objective insofar as it:

- avoids direct disturbance of significant terrestrial habitats within the main construction footprint;
- maintains aquatic ecological values beyond the immediate mixing zone, with effects assessed as minor; and

- incorporates mitigation and monitoring measures to protect and maintain ecological function over time.

However, there are residual considerations relevant to full consistency. The works occur in proximity to an ecologically significant river system, and while direct habitat loss is limited, there are localised modifications (e.g. outfall structure, temporary construction disturbance, and mixing zone effects) that will be managed via mitigation rather than complete avoidance, although ecological function will be maintained.

Overall, the proposal is consistent with the NPS-IB, as it appropriately identifies significant biodiversity values, avoids direct impacts on highly significant terrestrial habitats, and manages residual effects through the effects management hierarchy.

7.2.4.4 National Policy Statement for Natural Hazards 2025

The National Policy Statement for Natural Hazards 2025 (NPS-NH) came into force on 15 January 2026, and promotes a risk-based approach to managing natural hazards, including flooding, seismic hazards and liquefaction, based on both likelihood and consequence. An assessment of the proposal against each of the policies of the NPS-NH is provided below.

Policy 1 – *When considering natural hazard risk associated with subdivision, use or development, the risk level must be assessed using the risk matrix.*

The proposal is consistent with this policy at an appropriate level for the scale and nature of the infrastructure by identifying the key natural hazards relevant to the site, including flooding associated with the Kawarau and Kimi-ākau/Shotover Rivers, seismic hazard (ground shaking and faulting), and liquefaction potential. The assessment describes the character of these hazards in the context of the receiving environment and the proposed infrastructure, noting in particular that: (i) the works are predominantly subsurface and will be reinstated to existing ground levels; (ii) the outfall structure is located within an already dynamic river channel subject to high-flow conditions; and (iii) the infrastructure does not involve habitable buildings or sensitive land uses.

Section 5 of the AEE and GHD's Surface Water and Groundwater Assessment assess the risk of flooding (as the key hazard of concern) in relation to the proposed effluent conveyance and discharge infrastructure, concluding that any effects are limited in scale and largely confined to localised hydraulic influences. Given the low vulnerability of the infrastructure and absence of exposure pathways to people or property, this level of assessment is proportionate and sufficient to demonstrate that natural hazard risks are understood for the purposes of Policy 1.

Policy 2 - *Natural hazard risk associated with subdivision, use and development must be managed using an approach that is proportionate to the level of natural hazard risk.*

The proposal is consistent with this policy, as it adopts a level of assessment and design response commensurate with the low-consequence nature of the infrastructure.

Policy 3 - *Where subdivision, use or development is assessed as having very high natural hazard risk, that risk must be avoided.*

Based on the preliminary design and associated technical assessments provided, the construction and operation of the effluent conveyance and discharge infrastructure is not expected to have a very high natural hazard risk.

Policy 4 - *Where subdivision, use or development, including any associated mitigation measures, will create or increase significant natural hazard risk on other sites, that risk must be avoided or mitigated using an approach that is proportionate to the level of natural hazard risk.*

While any above-ground infrastructure associated with the outfall and effluent pipeline may have a limited impact on surface water flood dynamics, this effect is not expected to be more than minor. Flood hazard risk will be further assessed as part of detailed design for the project.

Policy 5 - *Natural hazard risk assessment and decisions must be based on the best available information and must be made even when that information is uncertain or incomplete.*

The natural hazard risk associated with the proposal has been determined based on the best available information, noting that a more robust assessment against flood risk (and subsequent mitigations developed, if required) will be undertaken as part of detailed design.

Policy 6 - *The potential impacts of climate change to at least 100 years into the future must be considered.*

While this policy does not explicitly state it, it is assumed that the potential impacts of climate change must be assessed with regards to natural hazard risk under this policy. The proposal is consistent with this policy to the extent that it recognises the long-term, dynamic nature of the Kawarau River environment and adopts a design that is inherently resilient to variability in flow conditions. While detailed climate change modelling (e.g. future flood scenarios) is not relied upon at this scale, the relatively low vulnerability of the infrastructure mean that possible increases in flood frequency or magnitude over time are not expected to result in a material increase in risk to people, property or the environment.

Overall, the proposal is broadly consistent with the NPS-NH, for the reasons provided above.

7.2.5 Regional Policy Statement

Until recently there has been two policy statements in effect in Otago – the operative Otago Regional Policy Statement 2019 and the Proposed Otago Regional Policy Statement 2021. However, all appeals on the 2021 RPS have now been resolved, therefore

it is now considered to be operative and beyond legal challenge. Therefore, for this application the ORPS 2019 has not been considered further.

The RPS provides the region's existing higher-level objectives and policies that regional and district plans must give effect to. Core themes driving objectives and policies in the RPS include integrated management, protection of freshwater and groundwater values, and iwi involvement in decision making. The RPS strengthens freshwater direction compared to that in previous statements, directly giving effect to Te Mana o te Wai, increasing emphasis on avoiding further degradation, managing connectivity between groundwater and surface water, and prioritising iwi partnership. Key policy drivers in relation to this proposal are assessed in Table 31 below.

Table 31: Assessment of RPS Objectives and Policies

Objective / Policy	Assessment of proposal	Consistency conclusion
MW-O1 / MW-P1–P3 (Mana whenua / Te Tiriti)	The proposal recognises mana whenua values through engagement, cultural impact assessment, and incorporation of cultural considerations into the AEE. However, consistent with MW-P provisions, the relationship of Kāi Tahu with freshwater is not provided for where direct discharge to water occurs. The assessment records that treated wastewater discharge to water is culturally unacceptable to Kāi Tahu, with a clear preference for land-based disposal. This results in an ongoing adverse effect on cultural values that cannot be avoided or fully mitigated, despite broader environmental improvements. The options selection process (see section 1.2) sets out the robust process applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.	Not fully consistent (significant adverse cultural effects remain)

IM-O1 / IM-O2 / IM-O3 (Integrated management, ki uta ki tai, sustainable impact)	The proposal is based on an integrated, ki uta ki tai assessment of effects, consistent with IM-O provisions. The assessment and supporting technical reports assess groundwater–surface water interactions, river mixing processes, and downstream receiving environment effects. The proposed river discharge has been considered at a whole-of-catchment scale, demonstrating integrated management of land and water resources, although cultural integration is not fully achieved.	Consistent overall
IM-P3 (Cultural values in integrated management)	Cultural values are identified and assessed, including through engagement with mana whenua and documentation of cultural effects. However, the proposal does not provide for the exercise of kaitiakitanga in a manner sought by Kāi Tahu, particularly given the continuation of discharge to water. As a result, cultural values are recognised but not fully integrated into the decision-making outcome. The options selection process (see section 1.2) sets out the robust process applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.	Partially consistent
IM-P5 (Environmental interconnections)	The proposal recognises and accounts for environmental interconnections, including groundwater–surface water pathways and downstream effects within the Kawarau River system. Modelling demonstrates that effects are largely confined to the near-field mixing zone (~40 m), with rapid dilution and downstream ecological or water quality effects that are less than or no	Consistent

	more than minor, reflecting appropriate consideration of interconnected environmental systems.	
IM-P6 (Uncertainty and precaution)	A precautionary approach has been adopted consistent with IM-P6. The GHD WQ Report applies conservative modelling assumptions (including peak dry weather flows and 95% percentile contaminant concentrations under low-flow river conditions), incorporates a multi-barrier treatment system, and proposes adaptive monitoring and management (including QMRA refinement). These measures appropriately respond to uncertainty in environmental effects.	Consistent
IM-P13 (Cumulative effects)	Cumulative effects are explicitly assessed, including existing groundwater-derived nutrient inputs from the DAD disposal system. The proposal is predicted to reduce these inputs through cessation of land discharge, and treated discharge quality is higher than current ambient conditions in parts of the receiving environment. As a result, the proposal is not expected to exacerbate cumulative effects and may contribute to incremental improvement over time in the near-field area and within the reasonable mixing zone.	Consistent
LF-WAI-O1 / LF-WAI-P1–P4 (Te Mana o te Wai)	The proposal maintains ecological health and human health outcomes through high levels of treatment and compliance with water quality standards either within the near-field, after reasonable mixing, or for phosphorus concentrations after complete mixing. However, Te Mana o te Wai requires prioritisation of the health and mauri of water bodies, including cultural values. The reliance on dilution rather than avoidance of discharge to water, and the cultural opposition to such discharge, means the hierarchy of obligations is not fully achieved in relation to mana whenua values. The options selection process (see section 1.2) sets out the robust process applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or	Partially consistent

	contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.	
LF-FW-O1A (Freshwater visions incl. phasing out direct discharge)	The proposal continues direct discharge of treated wastewater to water rather than phasing out such discharges over time, which is anticipated by the freshwater visions. While the optioneering process as summarised in section 1.2 sets out a robust alternatives assessment demonstrating constraints on land-based options at scale, the outcome nevertheless creates tension with the long-term policy direction to reduce and eliminate direct discharges to water. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.	Partially consistent
LF-VM-O2 (Clutha Mata-au FMU vision)	Modelling indicates no measurable degradation of water quality beyond the mixing zone for key indicators, with nitrogen species remaining within NPS-FM Attribute Band A after reasonable mixing. While localised increases in dissolved reactive phosphorus are predicted within and immediately beyond the mixing zone, these are assessed as minor in magnitude and do not result in observable degradation at a reach scale. Contact recreation standards (Class CR) are achieved. As such, the broader values of the Freshwater Management Unit (FMU), including recreational use and overall water quality, are maintained.	Consistent overall
LF-FW-O8 / P11–P12 (Outstanding water bodies / WCO values)	The Kawarau River's outstanding values, including water quality, natural character and recreation, are maintained. Effects are localised to the mixing zone, with rapid dilution and no discernible change in water quality, ecological condition or	Consistent

	visual/natural character attributes at a reach scale downstream. While localised increases in phosphorus concentrations are predicted following reasonable mixing, these are minor and do not undermine the identified outstanding values. Compliance with contact recreation standards further supports protection of those values.	
LF-FW-O10 / LF-FW-P13 (Natural character)	Effects on natural character are no more than minor and low in scale and extent, and largely confined to the immediate vicinity of the outfall. The broader form, processes, and experiential values of the river are maintained, with less than minor change at reach or landscape scale.	Consistent
LF-FW-P7 (Water quality, habitat protection)	Water quality modelling demonstrates that, after reasonable mixing, nitrogen species remain within NPS-FM Attribute Band A and overall changes in water quality are no more than minor. However, localised increases in dissolved reactive phosphorus are predicted following reasonable mixing, which may influence periphyton growth potential but are limited in spatial extent. Ecological assessments indicate less than minor change to habitat or aquatic communities at a reach scale, and no measurable effects on fish populations are anticipated. Overall, freshwater ecosystem health and habitat values are maintained.	Consistent
LF-FW-P16 (Wastewater discharge policy)	LF-FW-P16 directs preference toward land-based discharges unless adverse effects on land are greater. The assessment includes a comprehensive alternatives assessment which concludes that full land disposal is not feasible at the required scale due to technical, environmental and operational constraints. On that basis, discharge to water is justified under the policy framework, with effects appropriately managed. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.	Consistent (with justification)

LF-LS-P22 (Public access)	Public access to river margins and associated recreational infrastructure is largely maintained. Construction effects are temporary and localised, and operational effects do not restrict access. The proposal therefore maintains existing public access arrangements consistent with policy intention.	Consistent
ECO-O1 / ECO-P10 (Indigenous biodiversity)	Ecological assessments conclude that effects on indigenous biodiversity are less than minor following mitigation, with no loss of habitat, decline in species abundance, or change in ecosystem function anticipated. The proposal therefore maintains biodiversity values consistent with ECO provisions.	Consistent
EIT-INF-O4 / P10 / P12 (Infrastructure provision)	The WWTP and associated discharge infrastructure are regionally significant and have a clear functional and operational need tied to urban development in the Whakatipu Basin. The proposal supports the ongoing provision of this infrastructure while managing adverse effects (other than cultural) to a negligible to no more than minor level through treatment, design and mitigation measures.	Consistent
EIT-INF-P13 (Location in sensitive environments)	While the discharge occurs within a sensitive and highly valued river environment, the proposal avoids, remedies or mitigates adverse effects to a high degree through treatment and discharge design. Residual effects are low in magnitude and spatial extent, and do not undermine the broader values of the receiving environment.	Consistent (with residual effects managed)
EIT-INF-P14 (Alternatives assessment)	A comprehensive and robust alternatives assessment has been undertaken, including land-based, groundwater and hybrid options. The assessment demonstrates that full land-based disposal is not feasible at the required scale, supporting selection of the proposed discharge as the most practicable option.	Consistent
O2 – Discharges to air	The proposed discharge and associated infrastructure will not result in offensive or	Consistent

	objectionable odour at off-site receptors, and therefore will not compromise human health or amenity values. The discharge is highly treated, and no ongoing significant airborne contaminant pathway is identified.	
AIR-P3 – Providing for discharges to air	Discharges to air associated with the WWTP and outfall (principally odour) will occur in a manner that avoids adverse effects on human health and amenity values. Any air discharge effects are minimal and managed through design and treatment processes, including modern treatment infrastructure and enclosed systems.	Consistent
AIR-P4 – Managing certain discharges	Potential air discharge effects (primarily odour from wastewater infrastructure) are addressed through treatment upgrades (including improved plant processes) and design of the discharge system. No noxious, dangerous, offensive or objectionable effects are expected beyond the site, and therefore no adverse air quality effects requiring avoidance or mitigation are identified. Reverse sensitivity effects are not anticipated given the existing WWTP designation and surrounding land uses.	Consistent
AIR-P6 – Impacts on mana whenua values	The discharge to air is not expected to give rise to offensive or objectionable effects at culturally significant locations, including wāhi tūpuna, wāhi tapu and wāhi taoka. While broader cultural concerns relate primarily to discharges to water, the air discharge component is assessed as having no material adverse effect on mana whenua values. Engagement with kā rūnaka has been undertaken and is ongoing.	Consistent

Evaluating this proposal against the relevant policies in the RPS indicates that in general they are likely to be able to demonstrate consistency with the overall policy direction in respect of instream effects on water quality and ecology values. Notwithstanding this, providing for Kāi Tahu values as mandated in the various policies is unable to be met. However, those values have been recognised and recorded, including through Kāi Tahu involvement in the optioneering process (see section 1.2). While the direct discharge to water was preferred, options that included a form of land passage or contact prior to

discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.

Of particular note is RPS Objective LF-FW-01A(8) which advocates for the phase out of direct discharges of wastewater to water bodies, to the extent reasonably practicable. While this is directly relevant to this proposal seeking a long-term discharge to the Kawarau River, weight needs to be afforded to the 'to the extent reasonably practicable' part of the Objective. Given that the long list and short list selection process sought to determine the most environmentally, economically, and socially-feasible solution to treated wastewater disposal, this objective has been given effect to as it is not reasonably practicable, in these circumstances, to completely phase out direct discharges of wastewater to water bodies. Again, the Wastewater Management Review Report condition ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.

Alternatives to the proposed discharge have been considered within the long-list report, as well as by way of an assessment of land-disposal feasibility within a wide radius (25km) from the Shotover WWTP and a review of the former DAD performance and rehabilitation potential. These are discussed further in section 1.2 above.

In summary, the proposed long-term discharge to the Kawarau River is generally consistent with the relevant RPS objectives and policies, particularly those relating to integrated management, infrastructure provision, water quality, ecological protection, public access, and natural character. This is primarily due to the high level of treatment, the rapid dilution and mixing within the receiving environment, and the evidence from technical assessments that adverse effects are low, localised, and not evident at the reach or catchment scale.

However, two areas of partial inconsistency remain:

1. Mana whenua and Te Mana o te Wai provisions, where direct discharge to water is culturally inappropriate and does not align with the preference for land-based treatment pathways.
2. Policy direction to phase out direct discharges to water, which the proposal does not directly achieve (but does include a 10-yearly review report process), although it is supported by a robust alternatives assessment demonstrating that land-based disposal is not reasonably practicable at the required scale.

Overall, when considered in the context of:

- the functional and operational need for regionally significant infrastructure,
- The essential (lifeline) community nature of the infrastructure,

- the absence of feasible alternative disposal methods, and
- the very low level of adverse biophysical environmental effects,

the proposal can be characterised as achieving broad consistency with the RPS, with identified areas of tension appropriately recognised and addressed through the AEE.

7.2.6 Regional Plan: Water

The RPW was made operative on 1 January 2004 and sets objectives, policies and rules that apply to the management of water in the region.

Due to the age of this plan, many of the objectives and policies do not accurately reflect the provisions of more recent, higher-order environmental legislation. For this reason, more weight should be afforded to the Otago RPS than the provisions of the RPW.

The relevant matters in the RPW are identified and assessed as set out in Table 32 below.

Table 32: Assessment of RPW Objectives and Policies

Objective / Policy	Assessment of proposal	Consistency conclusion
Objective 5.3.1 – maintain or enhance natural and human use values	After reasonable mixing, water quality is predicted to remain consistent with high quality receiving water and relevant natural and human use values, with effects on ecology, recreation and downstream uses assessed as less than minor. The recreation assessment concludes recreation values will be sustained, and the ecology assessment concludes ecological effects are less than minor.	Consistent overall
Objective 5.3.2 – maintain or enhance Kāi Tahu values	The proposal has been developed with mana whenua engagement and the above assessment recognises relevant cultural values. However, it is also acknowledged that direct discharge of treated wastewater to water remains culturally problematic. While ecological and water quality effects are managed to low levels, the direct discharge results in an ongoing tension with Kāi Tahu spiritual and cultural values and cultural effects that are more than minor and likely to be significant. The options selection process (see section 1.2) sets out the robust process applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by	Partially consistent / tension remains in relation to Kāi Tahu values

	Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.	
Objective 5.3.3 – protect natural character	The landscape and natural character assessment concludes that natural character effects are localised and overall low adverse, with reach-scale values maintained due to the limited physical footprint, buried pipeline, and minor scale of permanent change at the outfall. Water-quality related natural character effects are also described as spatially confined and rapidly diminishing through mixing.	Consistent
Objective 5.3.4 – maintain or enhance amenity values	Amenity and recreation effects are assessed as negligible to no more than minor in operation, with localised and short-term construction effects that reduce following reinstatement. The buried pipeline, low-profile outfall design, and limited long-term visibility mean amenity values of the wider river corridor are maintained overall.	Consistent
Objective 5.3.5 – maintain or enhance public access	Access to the the study area will remain available. Construction may temporarily disrupt parts of the Twin Rivers Trail and some informal river access points, but with management and reinstatement these effects are short term; construction access effects are no more than minor, and operational access effects are negligible.	Consistent
Objective 5.3.6 – provide for sustainable use and development of water bodies	The proposal provides for long-term wastewater infrastructure servicing the Whakatipu Basin while avoiding significant adverse effects through treatment upgrades, discharge controls, and monitoring. The assessment of effects supports that the infrastructure can operate while maintaining receiving environment values at the relevant scale.	Consistent
Objective 5.3.8 – avoid exacerbating natural hazards	The water quality / hydrology assessment concludes that the outfall structure will only slightly reduce channel cross-sectional area, is not expected to cause damming or materially alter return flow, and hydrology effects are less than minor. The assessment also identifies that	Consistent

	further design refinement will be able to confirm flood performance.	
Policy 5.4.2 – prioritise avoiding adverse	The proposal has clearly sought to avoid effects through location, treatment upgrades, and outfall design, with residual adverse effects on water quality, ecology, natural character, recreation and hydrology are negligible, less than minor, or no more than minor. However, the policy's direction regarding avoidance of adverse effects on Kāi Tahu spiritual and cultural values is not fully met because direct wastewater discharge to water remains culturally adverse (see the assessment of Objective 5.3.2 above). Flooding, sedimentation and property-damage effects are assessed as less than minor.	Generally consistent, but only partially consistent in relation to Kāi Tahu values
Policy 5.4.2A – avoid loss of river extent and values	The proposal does not involve a significant loss of river extent, and effects on river values are assessed as localised and low. The outfall location is justified by functional / operational need linked to dispersion and mixing, and effects are avoided or minimised through design and mitigation.	Consistent
Policy 5.4.3 – priority to avoid adverse effects on lawful users	Recreation and other lawful uses of the Kawarau River corridor are expected to continue, with negligible effects for most users outside the near-field area and low to negligible long-term access effects. There will be no material interference with existing lawful downstream uses.	Consistent
Policy 5.4.4 – recognise Kāi Tahu values	The assessment records ongoing engagement with mana whenua and recognises cultural values as part of the assessment and optioneering process. That engagement supports consistency with this participatory policy, even though substantive cultural disagreement with the discharge remains.	Consistent
Policy 5.4.5 – recognise the WCO	The Kawarau and Kimi-ākau/Shotover reaches are subject to the WCO. The assessment concludes water quality after reasonable mixing remains suitable for contact recreation, hydrology effects are less than minor, recreation values are sustained, and natural character effects are low and localised. The technical assessments collectively assess that the WCO values are protected/sustained.	Consistent overall

Policy 5.4.6 – public access only restricted where necessary	Any restrictions on access are temporary during construction (with alternative routes provided), or highly localised around the outfall for safety purposes. The recreation report concludes public access is maintained across the area and operational effects are low to negligible.	Consistent
Policy 5.4.8 – particular regard to identified natural character features	The landscape / natural character and supporting water quality/ecology assessments directly address bed form, flow, colour / clarity, ecology and modified catchment context. They conclude the discharge will not materially alter water colour or clarity and permanent physical change is limited to a small area at the outfall within an already modified reach.	Consistent
Policy 5.4.9 – particular regard to amenity values	The technical assessments explicitly consider these factors and conclude that operational visual/amenity effects are negligible to no more than minor and recreation effects are negligible to no more than minor and highly localised. The wider river corridor's aesthetic and recreational values are therefore maintained.	Consistent
Objective 7.A.1 – maintain water quality	The water quality assessment concludes that after reasonable mixing, water quality is maintained and largely consistent with relevant standards, with the exception of phosphorus remaining elevated above background levels at the end of the reasonable mixing zone, though complete mixing predictions improve further downstream. The proposal also contributes to improvement by replacing poorer existing disposal pathways and ceasing ongoing effects from the DAD and emergency discharge over time.	Consistent overall
Objective 7.A.2 – enable discharges	The proposal is supported by treatment and design measures that maintain water quality and natural/human use values at the relevant receiving environment scale, with adverse biophysical effects assessed as less than minor to no more than minor. However, support for Kāi Tahu values is only partial, because although the biophysical effects are low, the discharge to water remains culturally significant (see the assessment for Objective 5.3.2 above).	Partially consistent in relation to Kāi Tahu values

Objective 7.A.3 – manage adverse effects including cumulative	Extensive treatment upgrades, modelling, and proposed monitoring all demonstrate active management of adverse effects. The cumulative water quality assessment concludes cumulative downstream effects are no more than minor.	Consistent
Policy 7.B.1 – Manage water quality	The proposal has been assessed explicitly against the Schedule 15 framework, including the receiving water limits and "Good Quality Water[53]" characteristics following reasonable mixing. The water quality modelling demonstrates that key parameters (e.g. ammoniacal-N, nitrate-N) are predicted to meet Schedule 15 limits and A attribute bands after reasonable mixing, with overall water quality remaining suitable for contact recreation and ecological function. While DRP is predicted to remain elevated at the edge of the reasonable mixing zone, the ecological assessment concludes this does not translate into measurable adverse ecological response due to the high-energy receiving environment and limited periphyton accrual potential. The proposal also recognises groundwater pathways and effects, with the shift away from the DAD system contributing to progressive improvement in groundwater and associated riverbank water quality. The assessment and supporting reports demonstrate clear consideration of the distinction between point source (the proposed discharge) and historical non-point/groundwater pathways. However, the policy's preference for discharge to land is only partially met. While alternatives have been assessed (see section 1.2) and upgrades implemented to reduce effects, the proposal retains a direct discharge to water, justified on the basis that land-based disposal is not reasonably practicable at the required scale.	Generally consistent, with partial inconsistency in relation to the preference for discharge to land
Policy 7.B.2 – avoid objectionable discharges	The technical reports support that the discharge will not create objectionable effects with water quality, public health and recreation effects assessed as negligible, less than minor, or no more than minor after reasonable mixing. However, a cultural objection remains in relation to the presence of human wastewater in water.	Consistent from a biophysical / human-use perspective, but partial tension

[53] "Good Water Quality" characteristics are identified in Table 15.1 in Schedule 15 of the RPW as: clarity, colour, sediment, smell, algae and bank appearance.

		remains for Kāi Tahu values
Policy 7.B.3 – allow discharges that have minor effects	The proposal's discharge effects are assessed as less than minor after reasonable mixing, with ecological effects less than minor, public health effects less than minor, and recreation effects negligible or no more than minor outside the near-field mixing area.	Consistent
Policy 7.B.6 – reasonable mixing zone	The proposal has been specifically modelled around near-field, reasonable mixing and complete mixing zones, taking into account the sensitivity of the receiving environment, natural and human use values, natural character, amenity, physical processes, contaminant type and volume, and the role of community infrastructure. There is strong alignment with the policy.	Consistent
Policy 7.C.1 – have regard to opportunities for enhancement	The proposal forms part of the shift away from the failed DAD disposal field and the temporary Shotover emergency discharge. The water quality and ecology reports note that groundwater and surface-water quality affected by the DAD are progressively improving, and the proposal is expected to avoid additional degradation and support improvement over time.	Consistent
Policy 7.C.2 – regard to certain matters	The AEE and technical reports comprehensively address the nature of the discharge, the sensitivity of the Kawarau and Kimi-ākau/Shotover River environment, comparison with alternative disposal options including their financial implications, and the use of current modelling and technical knowledge. The alternatives assessment in section 1.2 is expressly relevant here.	Consistent
Policy 7.C.3 – regard to standards/ guidelines	The water quality and ecology assessments explicitly use NPS-FM attribute bands, Schedule 15 values, ANZG criteria and WCO contact recreation requirements to assess outcomes and inform conditions/monitoring.	Consistent
Policy 7.C.4 – consent duration for new consents for existing discharges	The application seeks a 35-year term and is replacing an existing discharge from the Shotover WWTP, albeit to a different direct receiving environment – surface water vs groundwater – but the same ultimate receiving environment of the Kawarau River. The discharge is expected to meet the relevant water quality standards where required to support instream values over the	Consistent

	duration, particularly after reasonable mixing and with proposed upgrades/monitoring. Noting that the modelled slightly elevated phosphorus levels at the end of the reasonable mixing zone (during low flows), and before complete mixing, are not expected to result in adverse effects on ecological values and therefore those values will continue to be supported. The evidence therefore aligns most closely with limb (a).	
Policy 7.C.12 – reduce effects of discharges from existing reticulated wastewater systems	This policy is a key tension point. The proposal is consistent with subclauses (b)–(d) because it involves progressive system upgrades, monitoring, improved treatment, and contingency measures. However, subclause (a) prefers discharge to land unless land effects are greater; the alternatives assessment concludes land-based disposal is not feasible at the required scale. Subclause (e) is only partly met because, although Kāi Tahu values are recognised and mana whenua engagement has occurred, cultural effects remain from the direct discharge to water. However, as demonstrated throughout the assessment, this proposal will see a reduction in adverse environmental effects resulting from the currently consented DAD discharge, consistent with the overall purpose of this policy.	Partially consistent
Objective 8.3.1 – maintain flood carrying capacity and bank stability	The hydrology assessment concludes that the outfall will cause only a small reduction in channel area and will not materially affect river stability, flood conveyance, or sediment carrying capacity. Effects are assessed as less than minor.	Consistent
Objective 8.3.2 – minimise water clarity reduction	Construction-related sediment effects are assessed as less than minor and manageable through erosion and sediment controls. The landscape report also indicates sediment release during construction is expected to have a very low level of effect with controls such as adherence to an ESC Plan.	Consistent
Policy 8.4.1 – manage adverse effects on flow and sediment processes	The hydrology and landscape reports conclude the indicative outfall structure (including pipe only alternative) will not materially alter flow or sediment processes in a way that adversely affects flood carrying capacity, stability, or associated structures. Physical modifications are small-scale and localised.	Consistent

Policy 8.6.1 – regard to adverse effects	The ecology assessment finds very low freshwater construction effects post-mitigation, including for fish habitat and sediment release. Ecological effects from bed and margin disturbance are less than minor, water quality effects are less than minor and, landscape/recreation amenity effects are temporary and localised, with a negligible or no more than minor effect on downstream users identified.	Consistent

Overall, the proposed WWTP discharge and outfall are generally consistent with the RPW provisions identified above, particularly in relation to maintaining natural and human use values, protecting natural character and amenity, maintaining public access, managing bed and margin effects, and maintaining water quality after reasonable mixing. This conclusion is supported by the technical evidence that operational effects on water quality, ecology, natural character, recreation and hydrology are predominantly negligible, less than minor, or no more than minor, and that the proposal incorporates treatment upgrades, monitoring and mitigation specifically directed to those outcomes.

The main qualifications to this conclusion are the provisions relating to Kāi Tahu cultural values and the policy preference for discharge to land rather than water. While the assessment demonstrates that alternatives have been considered and that land-based disposal has not been identified as feasible at the necessary scale, and while engagement with mana whenua has occurred, the proposal still involves a direct discharge of treated wastewater to water and therefore remains only partially consistent with those provisions that seek to avoid or reduce that outcome and to fully provide for Kāi Tahu spiritual and cultural values.

The options selection process (see section 1.2) sets out the robust process (which included Kāi Tahu) applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.

7.2.7 Regional Plan: Air

The RPA was made operative on 1 January 2003, and sets out provisions that apply to the management of discharges to air in Otago.

The relevant matters in the RPA are identified and assessed in Table 33 below.

Table 33: Assessment of RPA Objectives and Policies

Objective / Policy	Assessment of proposal	Consistency conclusion
Objective 6.1.1 – Ambient air quality	The receiving environment is characterised by generally high ambient air quality. The odour assessment concludes that odour from the WWTP will be unlikely to be offensive or objectionable beyond the site boundary, and odour from the outfall is unlikely to be detectable at sensitive receptors due to low intensity, separation distance (>~1 km) and low frequency of relevant meteorological conditions. This indicates that the proposal will not degrade existing ambient air quality, and will maintain current air quality conditions.	Consistent
Objective 6.1.2 – Avoid adverse localised effects	The odour assessment confirms that both the WWTP and outfall are unlikely to result in adverse localised effects on human health, amenity values, ecosystems, or the life-supporting capacity of air. Odour effects are expected to be weak, intermittent, and infrequent at off-site receptors, with low likelihood of meaningful duration or offensiveness. The assessment also identifies that the discharge does not involve harmful airborne contaminants beyond minor odour.	Consistent
Policy 7.1.1 – Relationship of Kāi Tahu with air	Engagement with Kāi Tahu has been undertaken in a limited capacity and there are cultural values associated with environmental discharges. While cultural concerns are primarily centred on the discharge to water, the odour assessment demonstrates that air discharges will not result in offensive or objectionable effects at off-site locations, including areas of cultural significance. Ongoing engagement with rūnaka provides a mechanism for participation in air resource management.	Consistent
Policy 8.2.3 – Consideration of applications	Avoidance of adverse effects on human health, ecosystems, and cultural and amenity values has been considered through the design and operation of the WWTP and outfall, including treatment upgrades and odour management (via the OMP). The odour assessment demonstrates that adverse	Consistent

	effects (including cumulative effects) are unlikely, noting that the outfall will not materially add to odour effects from the WWTP and cumulative odour effects are assessed as low. Existing air discharges from the WWTP have also been considered, with limited complaint history indicating effects are not regularly experienced.	
Policy 8.2.4 – Duration of permits	The nature of the air discharge is limited to low-intensity odour associated with treated wastewater and wastewater processing. The receiving environment includes separation distances to sensitive receptors, low frequency of meteorological conditions that would lead to effects, and an existing operational WWTP context. The odour assessment indicates that effects are stable, low-risk, and well understood, which supports the appropriateness of a longer-term consent duration, subject to operational controls and monitoring.	Consistent
Policy 11.1.1 – Odour management	The proposal incorporates good practice odour management consistent with this policy, including: operational controls and monitoring through an OMP; process technology to minimise odour generation; and separation distances and site layout to reduce off-site effects. The odour assessment explicitly applies recognised assessment tools (FIDOL) and concludes that odour will not be offensive or objectionable beyond the site boundary. These measures collectively demonstrate avoidance or mitigation of adverse effects on human health and amenity.	Consistent

The proposed WWTP discharge and outfall are consistent with the RPA objectives and policies, as:

- Off-site odour effects are unlikely to be offensive or objectionable,
- Ambient air quality will be maintained, and
- Adverse effects on human health, amenity, cultural values and ecosystems are avoided.

This conclusion is supported by the Odour Report, which finds that:

- odours from the WWTP are infrequent, weak to distinct, and unlikely to persist, and
- odours from the outfall are low intensity, generally not detectable at sensitive receptors, and occur under limited meteorological conditions,

- with no material cumulative odour effects anticipated between the WWTP and outfall.

The assessment demonstrates that the proposal is generally in accordance with the objectives and policies of the RPA.

7.3 Other Matters

7.3.1 Iwi Management Plan

The proposed activities are subject to the below Iwi Management Plans (IMP):

- Te Rūnanga o Ngāi Tahu Freshwater Policy Statement 1999 (FPS)
- Kāi Tahu Ki Otago Natural Resource Management Plan 2005 (Kai Tahu Ki Otago NRMP)
- Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 (Te Tangi a Tauira)

These IMPs set out Kāi Tahu natural resource and environmental management issues, and objectives and policies to guide decisions in responding to issues expressed by the Papatipu Rūnaka representing hapū who hold manawhenua over the area. The documents also provide guidance to Papatipu Rūnaka when participating in resource management processes, and decision makers regarding cultural values and interests.

7.3.1.1 Te Rūnanga o Ngāi Tahu Freshwater Policy Statement

The FPS is the overarching Ngāi Tahu policy document relating to the management of freshwater. The FPS contains a suite of objectives that are directive in relation to the discharge of contaminants to water, particularly human-derived effluent. Of particular relevance, Objective 6.2 (Maintenance and enhancement of water quality) seeks to ensure that water quality is maintained or improved where it is degraded, and that contaminants do not compromise the mauri of waterbodies. While the WWTP proposal incorporates significant treatment upgrades and is predicted (based on the assessment of effects) to achieve high levels of contaminant removal and avoid significant adverse biophysical effects, the continued direct discharge of treated wastewater to the Kawarau River remains in tension with this objective. This is because the policy framework places emphasis not only on measurable water quality outcomes, but also on protecting mauri and avoiding contamination of culturally valued water, including where effects may be less than significant from a biophysical perspective.

Similarly, Objective 6.3 (Protection of mauri) and Objective 6.4 (Avoidance of contamination, particularly from human effluent) strongly favour discharge regimes that avoid introducing human-derived contaminants into waterbodies, reflecting the cultural imperative to separate human waste streams from natural water. The proposal's reliance on a long-term discharge to water, rather than land-based disposal, sits in clear tension with these objectives, which anticipate avoidance of such discharge

pathways where practicable. While the application demonstrates that a fully land-based alternative is not reasonably practicable at this time, and includes ongoing engagement with mana whenua and adaptive management measures, these aspects do not fully resolve the underlying policy conflict. Accordingly, the proposal can be characterised as only partially consistent (or overall inconsistent) with Objectives 6.2–6.4, due to the continued discharge of treated effluent to water and the resulting cultural effects on mauri, despite improvements in treatment performance and ecological outcomes.

7.3.1.2 Kāi Tahu Ki Otago Natural Resource Management Plan

Included below is a list of policies included in the Kāi Tahu Ki Otago NRMP that are considered particularly relevant to the proposed activities:

- To require an assessment of instream values for all activities affecting water.
- To protect and restore the mauri of all water.
- To require land disposal for human effluent and contaminants.
- To require consideration of alternatives and use of new technology for discharge renewal consents.
- To encourage Kāi Tahu ki Otago input into the development of monitoring programmes.
- To require monitoring of all discharges be undertaken on a regular basis and all information, including an independent analysis of monitoring results, be made available to Kāi Tahu ki Otago.
- To encourage Management Plans for all discharge activities that detail the procedure for containing spills and including plans for extraordinary events.
- To require visible signage informing people of the discharge area; such signs are to be written in Māori as well as English.
- To require reticulated community sewerage schemes that have the capacity to accommodate future population growth.

7.3.1.3 Ngāi Tahu ki Murihiku Natural Resource and Environmental Management Plan

Included below is a list of policies included in Te Tangi a Tauira that are considered particularly relevant to the proposed activities, in relation to the High Country and Foothills section of the plan:

- Protect and enhance the mauri, or life supporting capacity, of freshwater resources throughout Murihiku.
- Promote the management of freshwater according to the principle of ki uta ki tai, and thus the flow of water from source to sea.

- Adopt a precautionary approach for any activity involving a waterway where there is an absence of detailed knowledge of that waterway (ecology, flow regimes, species, etc).
- Avoid the use of water as a receiving environment for the direct, or point source, discharge of contaminants. Even if the discharge is treated and therefore considered "clean", it may still be culturally unacceptable. Generally, all discharge must first be to land. This general policy is a baseline or starting point. From this point, the Rūnanga can assess applications on a case-by-case basis.
- Assess discharge to water proposals on a case-by-case basis, with a focus on local circumstances and finding local solutions.
- Consider any proposed discharge activity in terms of the nature of the discharge, and the sensitivity of the receiving environment.
- When assessing the alternatives to discharge to water, a range of values, including environmental, cultural and social, must be considered in addition to economic values.
- Any discharge activity must include a robust monitoring programme that includes regular monitoring of the discharge and the potential effects on the receiving environment.
- Ngāi Tahu ki Murihiku consider activities involving the discharge of contaminants to water a community issue. For this reason, ngā rūnanga may, where seen as appropriate, recommend that a consent application be notified.

7.3.1.4 Assessment of Iwi Management Plans

There is a strong preference throughout the identification of issues and associated policies in the IMPs for wastewater to be minimised, appropriately treated and discharged to land in an appropriate manner, and to avoid any discharges of wastewater to water.

The following points demonstrate where the discharge is consistent with several of the policies of both IMPs:

- Upgraded treatment with the addition of tertiary filtration, chemical dosing and enhanced UV disinfection;
- Improvements to the Operations and Maintenance Manual and contingency and incident response procedures to minimise any poor plant performance and ensure contingency measures are in place;
- The provision of signage in Māori and English;
- A robust monitoring programme for both the discharge and receiving environment. Additional input into this programme from Kāi Tahu is welcomed and monitoring results will be made available soon after they are received online;

- The water quality assessment in Section 5, demonstrates that traditional water quality attributes (e.g. microbiological, nutrient and sediment) will receive enhanced treatment prior to discharge and subsequently further dilution within the mixing zone and still provide for the natural and human use values within the river environment (e.g. recreational and amenity values).

Ultimately, however, the discharge is inconsistent with some and contrary to several provisions in the IMPs, noting the cultural offensiveness of discharges of human sewage to water and strong mahinga kai values that Kāi Tahu places on the rivers in the region. In particular, the proposal is at odds with the provisions that seek to avoid using water as a receiving environment for contaminants.

The options selection process (see section 1.2) sets out the robust process (which included Kāi Tahu) applied to achieve the final preferred option (and the selected options). Options that included a form of land passage or contact prior to discharge to the Kawarau River (or Kimi-ākau/Shotover River) were also explored through the process but not supported by Kāi Tahu. Conditions are also proposed to provide for Kāi Tahu in the construction and operation of the consents should they wish to. The Wastewater Management Review Report condition however ensures 10-yearly reviews and consideration of new technologies that may be feasible to implement.

7.3.2 Local Government Water Services Act 2025 (WSA)

Whilst not an explicit matter for decision-makers to consider under s104 for a consent application, recent legislation changes introducing the WSA were enacted at the end of August 2025. QLDC (the applicant) has obligations under that Act alongside its other statutory obligations, which has relevance in the assessment of alternatives undertaken (refer section 1.2).

Section 254 includes the following statement:

> ***Obligation to consider cost-effectiveness of wastewater options***
>
> *(1) This section applies when a water service provider makes a decision relating to -*
>
> *(a) options for providing wastewater infrastructure,*
>
> *(b) options for treating wastewater.*
>
> *(2) The water service provider must, when making a decision under subsection (1), choose the option it considers to be the most cost-effective option for providing wastewater services over the life of the infrastructure assets required to implement that option.*

Cost-effectiveness is not defined in the WSA. The consideration under section 254 is of all "cost" over the life of the asset. It therefore includes design, consenting and construction costs, operational and maintenance costs, and whole of life costs (including decommissioning costs), but does not necessarily mean the cheapest option upfront.

The need for decisions on infrastructure options to be cost-effective must also be read considering the objectives of a water service provider (in this case QLDC). Section 17 of the WSA describes the objectives of a water service provider to include provision of water services that are reliable, resilient, of a quality that meets consumer expectations and meet all regulatory requirements, while also providing these services in a cost-effective and financially sustainable manner.

Overall, the proposed option represents a balanced and appropriate outcome when considered against the requirements of the WSA and the relevant resource management framework. The option has been identified through a comprehensive assessment of alternatives as the most cost-effective solution over the full life of the infrastructure, having regard to capital, operational, and long-term costs, thereby meeting the obligation under section 254 of the WSA. At the same time, it is capable of delivering a reliable, resilient and compliant wastewater service in accordance with the objectives of section 17, including meeting regulatory standards and environmental performance expectations.

Importantly, the preferred option does not achieve cost-effectiveness at the expense of environmental outcomes, as its effects have been demonstrated through technical assessment to be appropriately avoided, remedied or mitigated, and generally meets other relevant statutory requirements under the RMA, including the preservation of natural character, protection of outstanding values including ecology, and maintenance of water quality beyond reasonable mixing. However, there remains some inconsistency with this option when considering it against the cultural values identified by Kāi Tahu and cultural values as provided for in the policy direction of the NPSFM, RPS and RPW.

7.4 Section 105 of the RMA

Under section 105, a consent authority must have regard to certain matters when considering an application for a discharge permit (or coastal permit), specifically:

(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.

Each of these matters are discussed in turn below.

7.4.1 Nature of discharge and sensitivity of receiving environment

The nature of the discharge is described in Section 2 of this document. A description of the receiving environment, and an assessment of its sensitivity to the effects of the discharge is made in Section 3.13. The assessment found that given the characteristics of the treated effluent discharge and those of the receiving environment, the effects of

the discharge on the receiving environment beyond the reasonable mixing zone are minimal, with the exception of effects on cultural values which are high. The Kawarau River as a receiving environment is identified as sensitive to the potential effects of the discharges, given the overall good water quality providing habitat for indigenous and sports fishery values, strong cultural association with the river including for mahinga kai, tourism and commercial uses and natural character, amenity and landscape values present in the river.

7.4.2 Reasons for proposed discharge

The reasons why the application has been made have been set out in Section 1 of this document

The applicant seeks consent for the discharge of treated wastewater to the Kawarau River as the only practicable and reliable long-term solution for managing wastewater generated within the Whakatipu Basin, following the demonstrated failure of the currently consented DAD disposal system and in accordance with the EO requiring a new disposal system to be implemented. A comprehensive and structured assessment of alternatives has considered a wide range of land-based, groundwater, hybrid, and surface water discharge options, and concluded that no feasible land-based or non-discharge alternative can accommodate the required volumes at the necessary scale due to land availability, hydrogeological limitations, technical constraints, and cost. Accordingly, the proposed discharge to the Kawarau River, supported by additional wastewater treatment upgrades and an optimised outfall design, is identified as the most effective, cost-efficient and resilient solution to meet current and future wastewater management needs while maintaining environmental and public health outcomes, notwithstanding that it remains in tension with Kāi Tahu cultural values.

7.4.3 Assessment of alternatives

An assessment of the alternative options considered for this proposal is outlined in Section 1.2.

A comprehensive assessment of alternatives has been undertaken, encompassing land-based, groundwater, hybrid, and surface water discharge options across both local and wider catchment scales. While land disposal is identified as the culturally preferred approach, detailed investigations confirm that no practicable fully land-based solution exists capable of accommodating projected wastewater volumes, due to significant constraints in land availability, hydrogeology, climate, and cost. Groundwater disposal options were assessed but found to be uncertain in capacity and unable to operate as stand-alone solutions, requiring continued discharge to surface water. Consequently, all viable alternatives either rely on, or ultimately result in, discharge to the Kawarau River, with hybrid options providing only partial mitigation. A fully land-based option was also tested at a high level but discounted due to substantial land requirements, extreme capital costs, and delivery risks. These findings demonstrate that, while alternatives to

river discharge have been robustly explored consistent with s105(c) RMA, there are no feasible alternatives that avoid discharge to surface water while meeting the project's operational, environmental, and legislative requirements.

7.5 Section 107 of the RMA

As the WEPS do not apply to the discharge section 107(1) states that a consent authority shall only grant a discharge permit if, after reasonable mixing, the discharge does not give rise to:

(c) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:

(d) any conspicuous change in the colour or visual clarity:

(e) any emission of objectionable odour:

(f) the rendering of fresh water unsuitable for consumption by farm animals:

(g) any significant adverse effects on aquatic life.

Appropriate measures are proposed to mitigate the risk to freshwater, such that the discharge, beyond a zone of reasonable mixing, will not give rise to the effects listed in section 107(1).

Oil, Grease, Scums, Foam, Floatable or Suspended Material

The wastewater treatment process is generally designed and managed to minimise the formation of oil, grease, scums foam, floatable or suspended material however, some level of these may still be present in the discharge. Visual monitoring of the effluent throughout the treatment process and prior to discharge occurs on a daily basis with formal water quality testing undertaken weekly. Should any issues be identified through this monitoring they can be rectified through modifications at the WWTP and if necessary, re-direction of the flow to calamity storage.

With the level of enhanced treatment and monitoring proposed, and the available mixing within the receiving environment, it is not anticipated that this discharge will result in the production of conspicuous oil or grease films, scums, foams, floatable or suspended material, both by itself and in combination with other discharges, after reasonable mixing.

Change in Colour of Visual Clarity

The proposed enhanced treatment of the effluent via a tertiary filter prior to discharge not expected to be visibly different in colour and clarity compared to the Kawarau River receiving environment. After immediate mixing at the outfall, there is unlikely to be any discernible influence on colour and clarity of river water.

Objectionable Odour

As discussed in the Odour Report (Appendix E), considering the relatively low frequency of light winds that can cause effects, low intensity of odours discharged and distance to receptors, odour emissions from the WWTP and outfall are unlikely to cause offensive or objectionable effects at off-site receptor locations or for those recreational users on the Delta.

Suitability for Animal Consumption

The discharge into the Kawarau River will not affect the suitability of the water for consumption by farm animals. There are no farm animals that currently drink this water in proximity to the mixing zone. The key contaminants in the discharge of microbiological bacteria and viruses, sediment and nutrients, such as nitrogen and phosphorus, will be at low concentrations following reasonable mixing. Overall effects on water quality and ecology the receiving environment is expected to be less than minor and therefore also likely to be suitable for consumption by farm animals.

Monitoring of downstream water quality in the Kawarau River since the recent discharge to the Kimi-akau/Shotover River recommenced, indicates that contaminant levels will remain within acceptable thresholds for livestock drinking water in the Kawarau River and would be expected to improved further with the proposed enhanced treatment.

Significant Adverse Effects on Aquatic Life

Aquatic ecosystems in the Kimi-akau/Shotover River could be sensitive to increased nutrient loading, sedimentation, and changes in water clarity.

The attached EcIA concludes that the proposed discharge is unlikely to result in significant adverse effects on aquatic life when assessed at the point of reasonable mixing (RS10). While the ecological assessment identifies a potential for localised increases in nutrient concentrations (particularly ammoniacal nitrogen, nitrate-nitrogen, and dissolved reactive phosphorus) within the immediate near-field mixing zone (approximately 40 m downstream along the true left bank), this area is spatially confined to a narrow plume occupying only a small proportion of the river width. Within this zone, some degree of ecological response (such as increased periphyton growth) cannot be ruled out; however, these effects are considered limited in extent, do not represent a significant adverse effect at the scale of the receiving environment and are before reasonable mixing is achieved.

Beyond the near-field mixing area, modelled water quality at RS10 indicates that ammoniacal nitrogen and nitrate-nitrogen return to NPS-FM Attribute Band A, with dissolved reactive phosphorus remaining elevated but subject to ongoing dilution and occurring within a highly dynamic river system. The EcIA concludes that, in this context, the magnitude of ecological effect is negligible, reflecting the Kawarau River's high hydraulic energy, mobile substrates, and limited habitat stability, which constrain

sustained periphyton growth and ecological response. Existing macroinvertebrate communities are already dominated by tolerant taxa, and there is no evidence to suggest that the predicted changes in water quality would result in a measurable shift in ecological integrity, trophic structure, or ecosystem function. Accordingly, significant adverse effects on aquatic life are not anticipated.

The applicant will undertake ongoing water quality and macroinvertebrate monitoring, and appropriate locations for the continued monitoring have been proposed, to ensure that any unforeseen effects are promptly identified and mitigated (refer Section 2.9).

8. Consultation

Clause 6(1)(f) of Schedule 4 of the RMA requires the identification of, and any consultation undertaken with, persons affected by the activity.

8.1 Mana Whenua

Given the significance of the Kimi-ākau/Shotover and Kawarau Rivers to iwi, the proximity of the discharge to surface water and the cultural concerns with human effluent discharges in and around water, the proposed discharge will impact on cultural values given the range of known and anticipated cultural, spiritual and historical values and identified effects.

Ongoing engagement with representatives from Te Ao Marama Inc (TAMI) and Aukaha – representing the local runaka – has been occurring on a roughly fortnightly basis since the project commencement in late 2024. This enables two-way discussion on a frequent basis and transparency to ensure all relevant information on the project is shared as it becomes available with TAMI and Aukaha.

TAMI and Aukaha have also participated in the development of the scoring criteria and the long-list optioneering/scoring workshop. They decided not to participate in the short-list workshop. Instead, they provided a position statement outlining their values and concerns with the disposal options (attached as Appendix H).

Further engagement with iwi continues, including through connection at a mana-to-mana level between runaka leaders and QLDC Councillors.

8.2 Other Stakeholders

Specific consultation on the proposed option has not been undertaken with Department of Conservation (DOC), however, feedback from DOC on the short-list options indicated that they were concerned about deep well injection options due to the generally relatively high quality "clean" water that can be expected in groundwater aquifers. They were also concerned that adverse effects would be harder to identify and remedy and therefore did not support that as an option. DoC advised that they would not provide

comment on the other short-list options due to the concerns raised by mana whenua with a discharge direct to surface water.

Discussions with Fish and Game on the short-list options indicated they are primarily concerned with the potential implications on water quality and wildlife from any of the short-list options. They have noted that there is angler use on the Kimi-ākau/Shotover upstream of confluence and on the Kawarau River. They would like to see that the level of treatment and mixing within the receiving environment for discharges does not result in significant water quality degradation and that the potential cumulative effects are given proper consideration for the downstream catchment in terms of contaminant loads. These concerns have been addressed in the assessment of effects at Section 5. Effects on anglers have been considered with proposed signage to be installed to advise of the location of any discharge and restrictions on use of the area, if any, that apply.

Discussion with the ORC Hazards team prior to lodgement on this proposed option has identified their concerns with ensuring that the integrity of the training line remains intact and access to the river margins to enable maintenance of the training line is provided for. The ORC Hazards team also noted the need to ensure that the proposed outfall does not compromise the river's capacity in times of flood flows which has been addressed in the assessment of effects (Section 5). The identification of some ORC stockpiled rock material on the Delta has been noted and the proposed pipeline excavation should be located outside this stockpile area, but conditions are proposed to ensure that these rocks are not removed during construction works. No significant further concerns have been raised at this stage.

After the long-list of options was developed, which included options for irrigation of land at Frankton Flats, meetings with QAC were held to understand and consider their feedback. QAC's primary concern was aviation safety and any operational impacts the Frankton disposal options may create as a result of construction and/or operation of new disposal infrastructure. QAC also expressed concern that installing discharge infrastructure could make the airport land unsuitable for construction and undevelopable in the future as there are master plans already in place with future development planned. This feedback contributed to the short-list options with moderate rate land infiltration to land on Frankton Flats not being carried through. Consultation will continue with QAC on this proposed option. Conditions have been proposed in relation to effects on nesting birds and to ensure the outfall structure does not attract bird species to ensure potential impacts on the airport can be mitigated as far as possible.

Consultation with the QLDC Sport and Recreation team also took place after the initial long-list development to discuss potential implications for the Queenstown Events Centre (QEC). QEC development plans include extension of the sports fields and introduction of additional infrastructure, buildings, and facilities on the site, to support the community's future recreational needs. This informed further evaluation of these

options and associated constraints to disposing of wastewater via moderate rate methods in this location.

Recreational stakeholders have also considered including Kawarau Jet and Queenstown Trails Trust. Further discussions will be held with Kawarau Jet and other commercial users/operators to ensure they are kept informed of progress and mitigation measures are developed as required to ensure their operations are not compromised as far as possible. Whilst consent specific consultation has not been undertaken with all the other potential recreational users of the area by QLDC, engagement to understand their values and concerns with a wide variety of river users did form part of the Rec Report (Appendix C). This assessment then used that feedback to confirm potential impacts and provide for recommended mitigation of areas of concern where possible.

8.3 Wider Community

A Communications Strategy was prepared by the QLDC Communications team and has been actioned since late 2025. This includes information having been made available on social media, in local newspapers and via a project specific page on the website. Three public drop-in sessions were held in mid-December 2025 and late January 2026 with these being advertised across multiple media platforms. There was very limited attendance from the community with only 10 people attending over the three sessions.

Further communication and engagement with the community will continue as required. The webpage will continue to be updated with further information on this application as it progresses through the lodgement and decision-making processes.

9. Section 95 Notification Assessment

Section 95A of the RMA sets out the steps which must be followed by a consent authority when determining whether to publicly notify applications for resource consent. Public notification is not precluded or required by section 95C, any rule or NES. However, the effects on cultural values are likely to be more than minor, and there is wide public interest in the treated effluent discharge activity for which consent is being sought and it may be concluded that special circumstances exist in relation to this proposal. Therefore, public notification of the application is requested by QLDC.

Because public notification is requested, no further consideration of limited notification is required under Section 95B.

10. Conclusion

Overall, the proposed discharge of treated wastewater from the Shotover WWTP to the Kawarau River represents a necessary and appropriate long-term solution to managing wastewater generated within the Wakatipu Basin. The assessment demonstrates that the existing land-based disposal system is no longer viable due to fundamental

hydrogeological constraints and that a comprehensive and iterative assessment of alternatives has been undertaken, including land-based, groundwater, hybrid and surface water options. This process confirms that there are no feasible, reliable and cost-effective alternatives that avoid discharge to surface water while accommodating projected wastewater volumes. The proposal therefore enables the continued provision of essential public infrastructure and supports the social, economic and environmental wellbeing of the community, while incorporating substantial mitigation measures, including enhanced treatment processes, improved discharge design, and a comprehensive monitoring and adaptive management framework, to avoid, remedy or mitigate adverse environmental effects.

While the proposal will result in some ongoing adverse effects, most notably in respect of cultural values associated with the discharge of treated wastewater to water, these effects have been transparently identified and carefully considered alongside the broader benefits and constraints of the proposal. Effects on surface water quality, ecology, recreation and amenity are assessed as being appropriately managed or mitigated, particularly given the high energy receiving environment and the improvements in effluent quality achieved through the upgraded treatment process. When considered in its entirety, and having regard to the purpose and principles of the Resource Management Act 1991, the proposal represents an appropriate and balanced response to a complex infrastructure and environmental issue, achieving sustainable management of natural and physical resources in the circumstances.

Appendix A: Surface Water and Groundwater Assessment

Appendix B: Ecological Impact Assessment

Appendix C: Recreation Assessment

Appendix D: Landscape and Natural Character Effects Assessment

Appendix E: Odour Effects Assessment

Appendix F: GHD Long-list Options Report

Appendix G: GHD Short-list Options Report

Appendix H: Cultural Position Statement

Appendix I: Option E Memo

Appendix J: DAD Assessment

Appendix K: Preliminary Plans and Civil Drawings

Appendix L: Current Consents

Appendix M: Cultural Impact Assessment for Emergency Discharge

Appendix N: Activity Assessment

Appendix O: Draft Proposed Conditions

Appendix P: ORC Kawarau River Water Quality Memo