

BEFORE THE ENVIRONMENT COURT
AT CHRISTCHURCH

I MUA I TE KOOTI TAIAO O AOTEAROA
ŌTAUTAHU ROHE

ENV-2024-CHC-

IN THE MATTER

of the Resource Management Act 1991

AND

in the matter of an application for an enforcement
order or orders under section 316 of the Act

BETWEEN

OTAGO REGIONAL COUNCIL

Applicant

AND

QUEENSTOWN LAKES DISTRICT COUNCIL

Respondent

AFFIDAVIT OF S [REDACTED] REED

Affirmed 21 December 2024

ROSS DOWLING MARQUET GRIFFIN
SOLICITORS
DUNEDIN

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AFFIDAVIT OF S [REDACTED] REED

I, S [REDACTED] REED of Queenstown, Principal Compliance Specialist, solemnly and sincerely affirm:

Introduction

1. I attach most of the exhibits to this affidavit as a bundle marked "SLR." When I refer to an exhibit, I refer to SLR followed by the page number. I also attach an addition exhibit as **SLRA**.
2. I am a Principal Compliance Specialist with the Otago Regional Council (**ORC**). I am responsible for overseeing the monitoring of the compliance of all wastewater treatment plants in Otago.
3. I am authorised by the ORC to carry out all of the functions and powers of a Principal Compliance Specialist under the Resource Management Act.
4. I hold a warrant (number 2022/69) from the ORC under section 38 of the RMA (**SLR001**). I have held a warrant since 25 November 2019.

Qualifications and Experience

5. I have a First-Class Bachelor's degree in Marine Biology from the University of Portsmouth in the United Kingdom (awarded 2007).
6. I started at the ORC as a Senior Environmental Officer on 14 October 2019. I was originally based in the Dunedin office, but I moved to the Queenstown office in November 2020.
7. My current role as Principal Compliance Specialist started from 19th February 2024. I am employed as the compliance lead on monitoring wastewater activities and my role involves providing oversight of ORC compliance monitoring activities associated with territorial authorities three water activities in Otago (including review of significant non-compliant audit reports, and high-risk sites).
8. Immediately prior to my employment at the ORC I was employed for approximately 1 year as an Environmental Specialist for Aesica Pharmaceuticals Ltd. I was responsible for supporting and providing technical knowledge to ensure compliance with the international



ISO14001 environmental accreditation standards and the relevant environmental regulations. This role involved daily sampling and onsite analysis of the site's wastewater prior to discharge to the public sewer. I also managed two water pre-treatment trials when wastewater and contaminated surface water was found to be failing the resource consents.

9. Before my employment at Aesica I was employed by Scotland's principal environmental regulator the Scottish Environment Protection Agency (**SEPA**) for approximately 7-8 years in 3 main environmental protection and assessment roles. I was employed as a Marine Ecologist Assistant Scientist (4 years), an Environmental Quality Scientist (1 year) and more recently as an Environment Protection Officer (**EPO**) (2.5 years).
10. The EPO role was similar to my previous position as a Senior Environmental Officer at the ORC as one main aspect of the role involved auditing and monitoring compliance with environmental consents.
11. During my time as an EPO (and with particular reference to my experiences with Wastewater regulation), I audited a number of wastewater plants, package plants and septic tanks which are often used for small rural communities or single dwellings. I was also involved in the pre-application, writing, and issuing of environmental consents for small to medium scale wastewater plants. I was a consultee for SEPA to local council on large-scale planning applications commenting on wastewater disposal methods. I also responded to pollution incidents when wastewater treatment methods failed or had other issues and impacts to the environment.

Shotover Wastewater Treatment Plant

12. Queenstown Lakes District Council (QLDC) owns and operates (through contractors) the Shotover (Queenstown) WWTP, located on the Shotover River Delta near Queenstown (the WWTP). The WWTP is in the bed of the river, on its true right bank, below the Queenstown airport terrace (Map 1 at **SLR002**
13. The WWTP is approximately 1.25 kilometers SSE of the intersection of State Highway 6 and Tuckers Beach Road, legally described as Lot 4, Deposited Plan 421841, and Lot 2, Deposited Plan 422388 (the Property) **SLR002**.



14. The topography of the Shotover River Delta is generally flat, with vegetated areas slightly elevated. About half of the delta is covered with small trees and scrub, while the rest is bare.
15. The Shotover River typically flows in braided channels. During freshes and floods, it spreads across the Delta. The Otago Regional Council (**ORC**) uses a training line, a man-made structure made of mostly rock, to direct the Shotover river's flow towards the Kawarau River on the true left (eastern) side of the Delta. This helps manage the river's flow, especially during high-water events, to prevent it from spreading uncontrollably across the Delta and affecting areas such as the wastewater treatment plant (**WWTP**). By controlling the river's discharge, the training line can also influence the distribution and infiltration of surface water into the groundwater system, leading to changes in groundwater levels, particularly in areas close to the river and the Delta.
16. Recently, the Shotover has not flowed into the area occupied by the WWTP and its disposal field, although braids or pools can form close to the plant.
17. This site is a unique type of river delta, where sediments are deposited at the confluence of two rivers rather than at a lake's headwaters or where freshwater exits to the sea. The Shotover and Kawarau Rivers converge at a 90-degree angle, causing the delta to act as a floodplain during floods, with sediment deposited by floodwaters. – **SLR002**.
18. The Shotover and Kawarau Rivers, along with their surrounding areas, are popular spots for recreational activities enjoyed by both individuals and commercial operators. The vicinity of the WWTP and disposal field is open to the public and frequently used for activities like walking, cycling, boating, and other water-based pursuits. The Twin Trails cycling and walking trail runs alongside the WWTP and its disposal field.
19. The Kawarau and Shotover Rivers have outstanding values recognized by a Water Conservation Order under the Resource Management Act, issued in 1997 and amended in 2013. My colleague at ORC, Rachel Brennan, has plotted the relevant protected section of the Shotover River on the map attached at **SLR003 to SLR005**.

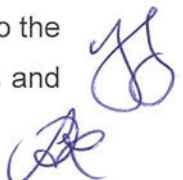


The WWTP

20. The Shotover Wastewater Treatment Plant currently services the Whakatipu Basin communities of Queenstown, Arthurs Point, Frankton, Kelvin Heights, Quail Rise, Shotover Country, Lake Hayes Estate, Lake Hayes, and Arrowtown.
21. The Shotover WWTP treatment process includes initial screening, primary treatment using oxidation ponds, and secondary treatment via a Modified Ludzack-Ettinger (MLE) process to remove nitrogen. The effluent is then pumped into a settling tank (clarifier) for further separation and clarification, followed by tertiary Ultraviolet (UV) disinfection before being discharged via a disposal field on the Shotover delta.
22. Currently, up to 80% of the effluent stream undergoes three levels of treatment before being discharged to the disposal field (refer to Map 1, Appendix 2). That treated effluent is blended with effluent directly from the oxidation ponds, undergoes UV sterilisation, and is then discharged to the disposal field. **SLR002**.
23. The disposal field is designed to disperse the effluent, with consent limits set post-UV treatment but before the disposal field. **SLR002**.

History of the Shotover WWTP to present date

24. I have reviewed ORC records in relation to the consent history.
25. QLDC currently manages the Shotover (Queenstown) WWTP under two main discharge consents: RM13.215.03.V2 for treated effluent to land (expiring December 2031) and RM13.215.01 for odour discharge.
 - 25.1. Air discharge consent RM13.215.01 allows for the discharge of contaminants to air for the purpose of operating the Queenstown wastewater treatment plant and expires in March 2044. **SLR006 - SLR011**
 - 25.2. Land discharge consent RM13.215.03.V2 allows the discharge of 'treated wastewater to land' and expires in December 2031. **SLR012 - SLR018**
26. Historically, the Shotover WWTP treatment process involved using the oxidation pond system, which discharged treated sewage directly into the Shotover River under various consents. According to ORC records and



consent recommendation reports, the discharge of treated wastewater into the Shotover River (under consent 2008.240) was supposed to cease by 22 April 2014. Consent 2008.238 was issued 13 May 2010 by the Environment Court. It appears that the intention was that QLDC would improve treatment of wastewater and switch to land-based discharge by 22 April 2014 operating under RM.2008.238.

27. However, in 2013, the QLDC decided to revise the treatment options and the timetable for implementing land disposal. It proposed a three-stage upgrade to transition the with the following indicative stages:

27.1. Upgrade the existing WWTP to provide partial wastewater treatment to meet mean effluent quality of 30:30:23:260 (BOD:TSS:TN:E.Coli) to be operational by 28 February 2017 while still discharging to the Shotover River (stage 1);

27.2. Install part of the land disposal system between 2017 and 2022 and have all normal flows discharged into land by 31 December 2022 (stage 2);

27.3. When nitrogen load triggers are reached (modelled at about year 2025), implement final WWTP upgrade so that effluent quality meets mean 10:10:10:10 (BOD:TSS:TN:E.Coli) effluent quality; and (stage 3).

27.4. Continue to expand the land disposal system as required to meet flows.

28. To enable the three-stage upgrade, QLDC applied for and was issued several discharge permits for the treatment and disposal of wastewater through to 2044:

29. RM13.215.01: Replacement of Discharge Permit 2008.239 for air discharge, expiring on 18 March 2044.

29.1. RM13.215.02: To discharge up to 26,049 m³/day into the Shotover River until 28 February 2017, allowing continuation of the discharge to the Shotover over river during upgrades.

29.2. RM13.215.03: To discharge up to 29,646 m³/day to land from 2017 until 2031 (or 2025) and addresses the progressive shift from discharge to water to complete discharge to land from Stage



1 of the upgrade of the WWTP and transitioning to higher quality effluent. Prior to discharge, approximately two thirds of wastewater would be treated by the new MLE treatment process, the remaining portion would be treated via the oxidation pond only. All wastewaters would undergo UV sterilisation before discharge to a dispersal field.

- 29.3. RM13.215.04: To discharge up to 26,672 m³/day into the Shotover River from 2017 until 31 December 2022, facilitating Stage 2 of land disposal system construction. Prior to discharge, wastewater would be treated in an oxidation pond.
- 29.4. RM12.237: Variation of conditions for existing Discharge Permit 2008.238 for Stage 3 land discharge of high-quality effluent, expiring on 18 March 2044 (and becoming 2008.238.V2)
- 29.5. Consent 2008.238 addresses the long-term situation (after the complete longer-term Stage 3 upgrade of the WWTP) where all treated wastewater from the WWTP will be discharged to land and considering the projected population increase.
- 29.6. Consent 2008.238 later became 2008.238.V2 following the previously mentioned RM12.237 variation and has not yet been exercised. Under this consent, 100% of the wastewater stream will be fully treated by the MLE process before undergoing UV sterilisation and being discharged to a dispersal field. This variation was initiated by QLDC as they wanted to change the location and the design of the previously consented disposal system. Changing the design from a Low-Pressure Effluent Distribution (LPED) to a high rate LPED system operated on a dose and drain (DAD) infiltration basis.
- 29.7. QLDC later upgraded the WWTP by installing the MLE treatment process (including the clarifier), and surrendered RM13.215.04 on 30th June 2019. This upgrade improved TSS and E. coli levels in the treated wastewater.
- 30. RM13.215.03.V2 currently allows QLDC to discharge treated wastewater to land. RM13.215.03.V2 was reissued on 9th March 2017 for the purpose of amending the legal description and map reference varying 6



existing conditions and the addition of new conditions 9, 10, 21, 22, 23. Under RM13.215.03.V2 QLDC can discharge treated wastewater to land via a disposal field in accordance with the operations and maintenance manual.

31. QLDC previously provided ORC with the Operations and Management Manual (OMM) for the treatment plant process dated June 2023 and an OMM for the Disposal system (at **SLR019 to SLR363 and SLR364 to SLR578**)
32. The OMM for the disposal system identified the location of the disposal field at appendix 1.
33. QLDC has submitted an updated OMM dated June 2024. I have attached it without appendices at **SLRA** onwards. It shows the Disposal field location at 3.10.4.
34. The disposal field is fenced and lies adjacent to the Twin Rivers cycle and walkway and is surrounded by land used for public recreation.
35. QLDC is still currently upgrading the WWTP so that consent 2008.238 can be exercised and RM13.215.03 surrendered. This is the third and final stage of a long-term programme by the QLDC to transition the plant from traditional Biological and Aerated Pond Treatment processes to the more efficient 'Activated Sludge Treatment' method and provide for future growth through to the year 2048.
36. I understand that the upgrades include the construction of a second Modified Ludzack-Ettinger (MLE) reactor, a second clarifier, and other supporting infrastructure. These improvements aim to double the plant's capacity and improve treatment quality ensuring that 100% of the wastewater undergoes three levels of treatment before being discharged to land via the disposal field. As the oxidation ponds will no longer be required as part of the treatment process, they will be drained and removed from the process. The first oxidation pond will be repurposed for stormwater management on site. Part of the pond will be converted to act as a calamity pond in the event the treatment plant goes offline. To date, pond one has been drained and the second MLE reactor and clarifier has been installed on site.



37. Once complete, these upgrades will allow the plant to receive additional wastewater flows from Jacks Point Village, Hanley's Farm, Ladies Mile and an extension of the Quail Rise residential development area.
38. According to Appendix A of QLDC's monthly infrastructure Programme update at **SLR579 to SLR599** (dated November 2024), the draining of remaining liquid from Pond 1 has been completed, and the residual sludge layer is being allowed to sun bake ahead of earthworks commencing in January. Structural works on the new MLE tank are almost complete, with the clean water drop test successfully finished and only minor remedials required. The final internal baffle walls are under construction, and the mechanical fit out is underway. The clarifier structure's clean water drop test was also successful, with minor remedials needed, and the mechanical installation is complete.
39. According to Appendix B of QLDCs latest Infrastructure Programme update (dated November 2024) construction of the upgrades is expected to be complete by December 2025 at **SLR600 to SLR609**.
40. There have been discussions of possible further upgrades but, to my knowledge there is no concrete proposal at this time.
41. Unfortunately, since February 2021, the Shotover WWTP disposal field has faced compliance issues due to sludge blinding, believed to be carryover from the treatment process. This has hindered infiltration, causing surface ponding of wastewater (which includes undertreated wastewater) and the discharge of treated or undertreated effluent outside the consented disposal field area. Consequently, two abatement notices (EN.RMA.21.0025 and EN.RMA.24.0012) have been issued. Refer to Table 1.

Table 1: Active abatement notices in place at the Shotover WWTP

Abatement No	Conditions	Non-compliance Related to	Date Issued	Current Compliance Date
EN.RMA.21.0025	15 & 20	Malfunction notification, No ponding or surface run-off of treated effluent	27/05/2021	30/11/2024

EN.RMA.24.0012	12, 14 & 21(b)	Discharge quality, OMM, No surface breakthrough 5 years post consent commencement	18/03/2024	29/03/2024 (and continue to comply thereafter).
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Abatement Notice – May 2021

42. Since February 2021, the Shotover WWTP disposal field has faced compliance issues caused by sludge blinding, believed to be carryover from the treatment process. This has hindered wastewater infiltration, causing surface ponding or treated (and sometimes untreated wastewater) within the disposal field and the discharge of treated or undertreated effluent outside the consented disposal field area. The ORC first became aware of these issues in February 2021, when the disposal field ‘failed’ due to sludge blinding, resulting in a significant discharge of treated effluent outside the consented security-fenced perimeter.

43. As a result of this incident and because of non-compliance with Conditions 15 and 20 of consent RM13.215.03.V2, ORC issued an abatement notice (**EN.RMA.21.0025**), and an infringement notice (**EN.RMA.21.0024**) in May 2021 at **SLR610 to SLR626**.

“15. The consent holder shall submit a record of complaints and malfunctions to the Consent Authority within two weeks after any complaint or malfunction occurring, together with the details of the remedial measures taken or proposed to be undertaken”

“20. No ponding or surface run-off of treated wastewater shall occur as a result of the exercise of this consent.”

44. EN.RMA.21.0025 originally stated that by 25 August 2021 (and thereafter), *‘that no ponding or surface run-off of treated wastewater shall occur as a result of the exercise of this consent’* (emphasis added). This applied to ponding both within and outside the consented disposal field area.

45. At that time the discharge and ponding within and outside the disposal field (which was not allowed by resource consent) was fully treated wastewater and was therefore not considered to be a significant environmental risk nor was it considered a health risk by the ORC at that time.

46. Upon the issue of EN.RMA.21.0025 and EN.RMA.21.0024, ponding outside the consented area was resolved, but minor to moderate ponding within the field persisted.
47. Despite QLDC's efforts to repair the Shotover WWTP disposal field following the issue of EN.RMA.21.0025, The situation has proven to be quite complex, and investigations have identified significant unplanned investment was required to fully address the disposal field performance. Site visits by ORC staff during 2021/22 revealed varying degrees of ponding and groundwater mounding both within and outside the disposal field. Ground water mounding is where the groundwater temporarily rises because of groundwater being directly below an infiltration system.
48. The 2023 audit report for RM13.215.03.V2 (V1) (at **SLR627 to SLR647**) written and issued by me for ORC dated 27 June 2023 commented that *"At the dispersal field several disposal field cells were 'open' [meaning uncovered] (photos 5 & 6) and there was no longer wastewater ponding outside of the consented area (photo 2). Moderate-significant levels of surface water ponding was present across the field, with significant ponding in the lower part of the disposal field (photos 3 & 4). All ponding was however contained within the security-fenced perimeter of the field at the time. However, 09/06/2023 QLDC alerted the ORC that ponding was occurring outside the fenced disposal area. Photos were supplied 12/06/2023 upon request. The disposal field site was visited 15/06/2023 with ORC Team leader consents planner Mat Bell. The ponding outside the disposal field had ceased at the time however ponding within the operational dispersal field had increased noticeably. During this meeting QLDC stated they cannot manage the field as it is throughout winter, and that ratepayer's money would be better spent on the longer-term solution. There was a discussion for a 2-year short term consent to discharge to the Shotover River directly via the previously consented outfall as an 'alternative and interim discharge' whilst the disposal field is repaired, modified or relocated entirely (possibly occupying the footprint of one of the oxidation ponds which are to be decommissioned earlier than planned). QLDC plan to line the flow channel with rip rap to create as much land contact as possible during this time. IWI is attending the site next week to discuss this proposal. QLDC are hopeful that consent application can be expected by ORC consents in a matter of months."*



49. ORC granted multiple extensions to the compliance due date for abatement notice EN.RMA.21.0025, with the latest extension set for November 30, 2024. Copies of most of the correspondence is at **SRL648-SLR674**.

27 December 2023

50. Operational failures affecting effluent quality, starting with odour problems, emerged in December 2023.
51. On 27 December 2023, I undertook an inspection at the WWTP. I could see that wastewater was discharging from the Disposal Field through the disposal field boundary fence from the SSE corner of the disposal field (refer Photographs 1 & 2 at **SLR675 & SLR676**). Refer Map 1 at **SLR002**.
52. The wastewater was flowing like a small river away from the disposal field and ponding on the Shotover Delta (refer Photographs 3 & 4 at **SLR677 & SLR678**). Refer Map 1 at **SLR002**.
53. I believe the wastewater was not properly treated because it was discoloured, silt laden and smelt of sewage. Properly treated sewage does not smell and is not discoloured or silt laden.
54. I took samples of the wastewater (at **SLR689**). A map of sample locations is at **SLR691**.

28 December 2023

55. On 28 December 2023, I attended the WWTP with Casey Pilkington because Jason Thornburn of QLDC had notified me by telephone that wastewater was discharging from the disposal field onto land outside the Property. Mr. Thornburn reported that the wastewater was flowing overland and into the Kawarau River.
56. When I was onsite, I saw that:
- 56.1. The flow of wastewater discharging from the SSE corner of the Disposal Field had extended for an additional 20 metres (approx.) since my previous site visit on 27 December 2023. There was an even larger area of ponded effluent outside the disposal field across the Shotover Delta than what I had seen on 27 December 2023, i.e. the day before. Refer Map 1 Appendix 2.



- 56.2. Wastewater was now discharging for approximately 100m from under the gate at the SSE corner of the Disposal Field to an area east of the Disposal Field where the wastewater then appeared to disappear.
- 56.3. Another large, ponded area of suspected wastewater adjacent to the Kawarau River (further downstream than the wastewater flow described in paragraph 56.1) which was discharging overland directly to the Kawarau River. Refer Map 1 Appendix 2.
57. These areas are publicly accessible and used for public recreation.
58. I took more samples from the large area of ponded wastewater outside the disposal field, (detailed in paragraph 56.1), samples from the new large, ponded area (detailed in paragraph 56.2) and samples from the Kawarau River upstream and downstream from the point the new ponded effluent was discharging into the Kawarau River (at **SLR692 to SLR694 & SLR695 to SLR696**). A map of sample locations is at **SLR002**.
59. The sample results of the ponded wastewater outside the disposal field showed extremely high levels of Escherichia coli (**E. coli**) and Total Suspended Solids (**TSS**). Biological Oxygen Demand (**BOD**) was also higher than the 95th percentile and annual mean limits of the resource consent.
60. The sample results of the new ponded area adjacent to the Kawarau River showed levels of E. coli higher than the resource consent 90th percentile and annual mean limits. The downstream samples taken from the Kawarau River were higher in E. Coli, Total Nitrogen (**TN**) and TSS than the upstream samples. Table 1 below records the sample results:

Table 1:

Parameter	Resource Consent 95 th Percentile limits) *	Resource Consent Annual Mean limits	Disposal field Discharge 27/12/2023	Disposal field Discharge 28/12/2023	Ponding @ Shot over Delta 28/12/2023	Kawarau River – U/S of Point of Discharge 28/12/2023	Kawarau River – D/S of Point of Discharge 28/12/2023
BOD5 (g/m ³)	50	30	43	Sample received too late	Sample received too late	Sample received too late	Sample received too late

TSS (g/m ³)	50	30	198	200	7.9	<2.5	4.7
TN (g/m ³)	35	23	58	54.8	5.88	0.15	1.42
E. coli MPN/CFU/10 0ml	260 (90 th Percentile) *	260 Geomean	38,000	41,060	387.3	3.1	86.7

*(on a rolling 12 calendar month period).

61. When analysing sample results for the purposes of this affidavit, I have compared the results against the 95th percentile and annual rolling mean limits in the consent rather than calculating the actual annual mean of 95th percentile for wastewater discharged from WWTP.
62. The sample results in Table 1 demonstrate that:
- 62.1. On 27 December 2023 and 28 December 2023, the wastewater discharged from the Disposal Field:
- 62.1.1. Contained contaminants at a significantly higher levels than the resource consent limits for the annual mean and the 95th percentile (for BOD, TSS, and TN) and the geomean and 90th percentile parameter (for E. coli.); and
- 62.1.2. Was not fully treated as required by the Disposal System Operations and Management Manual (OMM) and the Resource Consent;
- 62.2. Ponding at Shotover Delta had levels of E. coli consistent with wastewater; and
- 62.3. Wastewater is likely to have entered water, namely the Kawarau River. The Kawarau is generally not used for swimming or other contact recreation.
63. By email dated 30 December 2023, QLDC notified ORC that it was working towards ceasing the discharge of partially treated wastewater “beyond the boundary of the site”.

25 January 2024 Inspection

64. On 25 January 2024, I carried out a follow-up inspection of the WWTP and saw that:
- 64.1. Wastewater was discharging from the Disposal Field through the fence at the southern boundary of the Disposal Field (refer photograph 5 at **SLR 679**).
 - 64.2. The wastewater was ponding in an area outside of the Disposal Field, between the Disposal Field fence line and the Twin Rivers Trail (cycle path).
 - 64.3. The ponded wastewater was approximately 100 metres long by 3 metres wide between the cycle path and the southern boundary.
 - 64.4. A map is attached at **SLR002**.
65. The public has access to these areas.
66. I took samples of the ponded wastewater, detailed in paragraph 64 (refer Table 2 below for sample results).

Table 2

Parameter	Resource Consent 95 th Percentile limits) *	Resource Consent Annual Mean limits	Disposal field Breach (South) Discharge to cycle path (Twin Rivers Trail) 25/01/2024	Ponding @ Shotover Delta Ponding Bottom Disposal Field 25/01/2024	Shotover WWTP Final Effluent (at autosampler) 25/01/2024
BOD5 (g/m ³)	50	30	22	11	17
TSS (g/m ³)	50	30	520	780	35
TN (g/m ³)	35	23	Not analysed	Not analysed	Not analysed
E. coli CFU/100ML	260 (90 th Percentile) *	260 geomean	5000	3700	16

*(on a rolling 12 calendar month period)

67. During this inspection, I re-inspected the southern boundary of the Disposal Field, from where wastewater had been discharging on 27 and 28 December 2023. I did not see any wastewater discharging from the southern end of the Disposal Field. However, I could see some evidence

of the wastewater that had been present there on 27 and 28 December 2023. I saw puddles of wastewater and algae across the affected area of the Shotover Delta (refer Photograph 6 at **SLR679**). When I reviewed the photo today it is clear that there is dry sludge apparent across the area to (refer Photograph 6 at **SLR 679**).

68. I took samples of the ponded area of the Shotover Delta East of the Disposal Field. Refer Table 2 for sample results, refer to **SLR695 to SLR696** for sample locations.
69. I met QLDC's contractor, Veolia, on site at the Property and took samples from the final discharge point at the autosampler from where wastewater is discharged to the Disposal Field. Refer Table 2 for sample results, refer to **SLR002** for sample locations.
70. The sample results in Table 2 demonstrate that on 25 January 2024:
 - 70.1. The wastewater at the autosampler was treated wastewater.
 - 70.2. However, the wastewater discharging overland from the eastern boundary of the Disposal Field to outside the Disposal Field was significantly higher than the 95th/90th percentile and annual mean (geomean) Resource Consent parameters limits for TSS and E. coli. I therefore concluded that it was not fully treated as required by the Disposal System OMM and the Resource Consent.
 - 70.3. Wastewater at the Disposal Field that discharged from the Southern boundary (to the land between the Twin Trails path and the Disposal Field) was not fully treated.
 - 70.4. Ponding at Shotover Delta southern boundary of the Disposal Field was wastewater and was not fully treated as required by the OMM and the Resource Consent.

21 February 2024 Inspection

71. On the 21 February 2024, I carried out an inspection of the Disposal Field and saw that:
 - 71.1. there were still some ponded areas of water south of the Disposal Field which smelt like sewage and there were a lot of green algae



growing in and around the ponded areas. (See Photographs 7 & 8 at **SLR380**)

71.2. there was an extensive sludge “crust” visible across the area of the Shotover Delta where the Disposal Field had been discharging on 27 & 28 December 2023. (See Photograph 9 at **SLR681**)

72. I attach a map showing the location of crust and photographs taken on 21 February 2024 at **SLR002**.

73. I took samples of the first few millimetres of the sludge crust and some of the remaining ponding in the Shotover Delta southeast of the Disposal Field (refer Table 3 for sample results). There was no visible discharge from the WWTP Disposal field occurring at the time.

Table 3:

Parameter	Resource Consent 95th Percentile limits*	Resource Consent Annual Mean limits	Shotover Delta Wastewater Crust & Ponding 21/02/2024
Total Recoverable Arsenic	N/a	N/a	8
Total Recoverable Cadmium	N/a	N/a	0.18
Total Recoverable Chromium	N/a	N/a	13
Total Recoverable Copper	N/a	N/a	79
Total Recoverable Lead	N/a	N/a	15.8
Total Recoverable Nickel	N/a	N/a	16
Total Recoverable Zinc	N/a	N/a	16
Faecal Coliforms	N/a	N/a	3,500,000
E. coli CFU/100ML	260 (90 th Percentile)*	260 geomean	2,500,000

*(on a rolling 12 calendar month period)

74. At the Property, I inspected the Disposal Field from the boundary and observed that earth bunds had been constructed around and within the Disposal Field. The bunds were not present on my previous inspections.
75. These bunds contained a volume of wastewater across the Disposal Field, which is a breach of condition 20 and/or 21(b) of the Resource Consent. (See Photograph 10 at **SLR681**)
76. The Disposal Field now looked like an oxidation pond which was approximately 1 metre deep. While I was looking at the Disposal Field the internal earth bunds/walls made of earth began crumbling and collapsing.
77. The outer earth bund (which was keeping wastewater within the Disposal Field) suddenly failed completely on the eastern side of the Disposal Field. A substantial flow of wastewater from the Disposal Field 'pond' flowed between the bunded cells of the Disposal Field and discharged overland on the eastern side of the Disposal Field. This wastewater ponded in a publicly accessible area between the boundary of the Disposal Field and the raised Twin Rivers Trail which runs alongside the Disposal Field.

22 February 2024 Inspection

78. On 22 February 2024, I returned to the Shotover Delta outside of the Disposal Field and saw:
- 78.1. The discharge of wastewater observed on 21 February 2024 from the Disposal Field 'pond' (through the eastern boundary fence of the Disposal Field) had ceased; and (See Photograph 11 at **SLR682**)
- 78.2. Wastewater was still ponded outside of the consented Disposal Field. (See Photograph 12 at **SLR682**)
79. I took samples of the ponded area of land between the Disposal Field eastern boundary and the Twin Rivers Trail (refer Table 4 for sample results and **SLR002** for sample locations).
- 79.1. I inspected the southern end of the Disposal Field. There was no active discharge from the WWTP Disposal Field but found that since the visit on 21 February 2024: Wastewater had discharged from under the Disposal Field gate at the SSE corner of the Disposal Field (where wastewater had

been discharging on 27 December 2023). The area under and around the disposal field gate was now saturated with wastewater. There was a visible flow path from the Disposal Field towards the gate. There were puddles that were not there the previous day. There was also fresh heavy vehicle track marks. (See Photograph 13 at **SLR683**).

79.2. Further east, from the Disposal Field, I saw a large, ponded area of wastewater across the Shotover Delta. This was in the same location where ponding was observed on 27 December 2023. This ponding had not been present the previous day (21 February 2024). (See Photograph 14 at **SLR683**).

80. I took samples from the ponded area of the Shotover Delta southeast of the Disposal Field.
81. On 18 March 2024 ORC served QLDC with an abatement notice EN.RMA.24.0012 (at **SLR697 to SLR766**). The abatement notice required QLDC to cease discharging wastewater that was not properly treated by 18 March 2024.
82. After this date, I was focused on other work for ORC. I then spent some time overseas recuperating from an injury.
83. When I returned back to work 9 September 2024, I became involved in the Shotover WWTP again but was unable to undertake any site visits due to my previous injury. During a debrief with ORC colleagues I was made aware of a number of breaches of EN.RMA.24.0012 that occurred during August and September 2024, followed by an additional breach in October 2024. Consequently, three infringements were issued:
84. EN.RMA.24.0012 was contravened when, from 6:16 PM on September 14, 2024, to 12:13 PM on September 18, 2024, wastewater was discharged beyond the southern boundary of the approved disposal field, violating condition 14 of the Resource Consent and the OMM (as the discharge was outside the approved disposal field). This resulted in the issue of Infringement Notice - EN.RMA.24.0073 October 29, 2024.
85. EN.RMA.24.0012 was contravened when, from 11:18 AM on September 27, 2024, to 8:23 AM on September 30, 2024, wastewater was discharged beyond the southern boundary of the approved disposal field, violating



condition 14 of the Resource Consent and the OMM (as the discharge was outside the approved disposal field). This resulted in the issue of Infringement Notice - EN.RMA.24.0074 October 29, 2024

86. EN.RMA.24.0012 was contravened when, from 15:57 PM on October 26, 2024, to 10:48 November 5, 2024, wastewater was discharged beyond the southern boundary of the approved disposal field, violating condition 14 of the Resource Consent and the OMM (as the discharge was outside the approved disposal field). This resulted in the issue of Infringement Notice - EN.RMA.24.0084 19 November 2024.

Most recent breach of EN.RMA.24.0012 (ongoing investigation number: IN24.0853)

87. At 13:32 PM on November 9, 2024, Veolia reported to the ORC out-of-hours pollution inbox that the Shotover WWTP disposal field was discharging beyond the perimeter fencing.
88. At 15:37 that same day, two out-of-hours ORC officers observed wastewater discharging through a large pipe directed to the boundary fence of the disposal field violating condition 14 of the Resource Consent and the OMM. The discharge flowed adjacent to the fence, creating a large, flooded area in an open clearing south of the Shotover delta. Wastewater was discharged beyond the southern boundary of the approved disposal field onto land which is publicly accessible.
89. ORC officers confirmed that no wastewater was discharging into the Shotover River at that time. A sample of the discharge was taken and couriered the following Monday morning.
90. Results from the sample taken 09 November 2024 indicated the discharge was likely treated at the time of sampling as all (refer to **SLR767 to SLR769** Samples taken by Joseph Fraser).
91. The E. coli result from 09 November 2024 should be interpreted with caution as the sample was over 24 hours old upon receipt at the lab.

Subsequent site visits since 9 November 2024 breach (IN24.0853) initiated.

92. ORC officers have inspected the Shotover WWTP disposal field a total of nine times between 19 November 2024 and 16 December 2024 (inclusive). Refer Table 4. I personally attended eight of these subsequent



visits with the last visit conducted 16 December 2024. Each visit confirmed that the discharge seen on 9 November 2024 was still ongoing.

93. The discharge did not stop during this time, and it is estimated that the flow of the discharge from the disposal field remained the same, but the depth and extent of ponding worsened until the 12 December 2024. On 12 December 2024, I saw that the ponded area appeared to be less ponded and assumed it was draining. I also observed this on the most recent visit on 16 December 2024.

Site visit 19 November 2024

94. I visited the Shotover Wastewater Treatment Plant (WWTP) to check if the discharge from the disposal field, which was initially reported to the ORC pollution hotline on November 9, 2024, was still occurring. I accessed the area via the public access to the Shotover Delta and cycle path without signing into the site.
95. As I approached the back of the disposal field on foot, I could hear a flow of water before seeing it. There was a substantial flow discharging from the Northeast corner of the disposal field. Refer photo 15 **SLR684**. It was flowing like a small river creating a very large pond in a publicly accessible area of the Shotover Delta. Refer photo 16 at **SLR685**. I considered that the ponding was as extensive as what I had seen on 27 December 2023.
96. This time, however, was the first time I had seen the disposal field breaching via a pipe that had apparently been installed intentionally by QLDC to prevent the disposal field bund walls collapsing each time the disposal field became overwhelmed. This pipe was discharging directly through the disposal field fenced boundary from a purpose built "emergency pond" located in the Northeast corner of the disposal field. The discharge flow had created a small channel around the northeast corner of the disposal field, and it flowed back up the north side of the disposal field by 10m or so. The main flow headed south and then spread out across the delta. The effluent was about halfway up my gum boots in some places. I was surprised at how bad the discharge had got. There had been no notification from QLDC/Veolia that it was this bad.
97. I saw small red invertebrates swimming in the discharge. There was also a lot of green algae and other floating debris that looked like sludge.



98. I waded through the ponded effluent and attempted to follow its extent. Most of the effluent flowed to a wooded area of the delta and ran along the east side of the cycle path. Refer photo at **SLR687** and map 1 at **SLR002** which shows the main extent and supposed flow path of the breach.
99. The ponded effluent appeared to stop/disappear to ground a few meters from the ORC training wall.
100. I climbed out of the wooded area and up on to the Twin Rivers cycle path and headed further east.
101. I noticed that the drainage ditch on the left-hand side of the cycle path was now full of water. Refer map 1 at **SLR002** and refer photo 18 at **SLR688** (taken on a subsequent visit on 3 December 2024). I could not recall water being present here before. The water was not obviously flowing, appeared quite stagnant and had a lot of green algae growing in it.
102. The ditch of water first appeared a few metres down/east from the training wall. Refer photo 18 at **SLR688** (taken on a later date - 3 December 2024 – but shows what I saw 19 November). I followed it towards the Kowarau River. After approx. 20m it disappeared again just in front of a track used by vehicles and then reappeared again in front of a sign for the Twin Rivers trail a few meters downstream. I followed this ditch as it turned at a right angle and flowed upstream parallel to the Kowarau River where it eventually discharged.
103. Given the duration and extent of the disposal field breach, which appeared to stop or disappear into the ground a few meters before the ORC Training wall/line, I was suspicious that the breach from the disposal field may now be reaching the Kowarau River.
104. As it was already late in the afternoon (meeting courier times were taken into account) I decided to attend the site again the next day to undertake extensive sampling and with a colleague for support.

Table 4:

Date	Officers attended	Samples taken	Sample results received	Compliance demonstrated?	Other lab analysis comments
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09/11/2024		Yes (disposal field discharge only)	22/11/2024	Results indicated that the discharge from the disposal field was fully treated at the time of sampling.	E. coli results should be interpreted with caution as the sample was over 24 hours old upon receipt at the lab
19/11/2024		No	N/a	N/a	N/a
20/11/2024		Yes (10 sets, inc MST)	26/11/2024	Results indicate that the discharge from the disposal field was fully treated at the time of sampling. BOD5 above the 12-month average limit but still within compliance due to averaging.	E coli analysed to >1000 range at all 10 sites. Unable to directly assess compliance with 260 CFU limit. No human MST markers were detected at 6/7 locations inc the disposal field. 1 sample showed a faint detection of human MST markers, just above the limit of detection (LOD)
25/11/2024		No	N/a	N/a	N/a
29/11/2024		No	N/a	N/a	N/a
03/12/2024		Yes (6 sets)	17/12/2024	Results indicate that the discharge from the disposal field & the final effluent discharge (post UV) was fully treated at the time of sampling.	
06/12/2024		Yes (6 sets)	Samples arrived too late; analysis cancelled	N/a	N/a
09/12/2024		Yes (6 sets)	20/12/2024	Results show that while the discharge from both the disposal field and the final effluent (post UV) was treated, neither met all	MST was conducted at the discharge to the Kowarau River location because the E. coli was over the trigger value of 500 CFU/100ml (result

				the limits set by consent RM13.215.03. The final effluent was compliant except for BOD and TSS, which exceeded the annual mean limit. In the disposal field discharge, BOD5, TN, and E. coli were within limits, but TSS exceeded the limit at 101 g/m³. The increase in TSS could be due to various factors, including natural ones.	1400). No human markers were detected. In fact, the source of the E. coli wasn't substantiated.
12/12/2024		Yes (6 sets)	20/12/2024	Results indicate that the discharge from the disposal field & the final effluent discharge (post UV) was fully treated at the time of sampling.	N/a
16/12/2024		Yes (6 sets)	TBC	Lab flagged: Discharge to Kowarau River sample FC over 1000 CFU/100ml so MST will be conducted at this location	Await full set of results

Site visit and extensive sampling 20 November 2024

105. I returned to the Shotover WWTP with my colleague Chris McSweeney to undertake extensive sampling starting at the discharge the disposal field and extending to 9 locations of ponding across the Shotover delta, including a potential discharge into the Kowarau River and 20 meters upstream and downstream of this discharge. This effort was largely prompted by the recent appearance of a new ponding area, which seemed to discharge into the Kowarau River. Refer photo 18 at **SLR688**.
106. I showed Chris how the disposal field was breaching via a pipe that had been installed intentionally by QLDC or its contractor. Chris was already aware that this pipe and the emergency pond had been built intentionally



to prevent the disposal field bund walls collapsing each time the disposal field became overwhelmed. It was his first time seeing it discharging though. I took a video of the breach and the extent of the ponding in the area immediately to the back (east) of the disposal field. Nothing had changed on site since the previous day in terms of the flow of the discharge and extent of the ponding. Refer photo 17 at **SLR686**. The discharge had a faint odour of sewage especially when we were standing downwind.

107. We walked through the suspected flow path I had identified the day before and as indicated by map 1 at **SLR002**. We confirmed that the ditch/new upwelling area appeared to still discharge to the Kowarau River. From memory, the ditch had always been there to protect the cycle path, but it just was not full of water before.
108. We returned to the back of the disposal field with sampling equipment. Chris took all the samples taken this day whilst I took photos, GPS readings and filled in the paperwork.
109. Chris took a sample from:
 - 109.1. the end of the pipe which discharged from the disposal field at E2173624 N556821. Samples called "Shotover WWTP discharge from disposal field".
 - 109.2. from approximately the middle of the large, ponded area in the Shotover delta at the back of the disposal field at E2176229 N556359. A second Micro sample was taken for MST analysis Samples called "Shotover delta ponding 1." Refer photo at **SLR687** which also shows how deep the ponding had become.
 - 109.3. the ponded effluent from the wooded area of the Shotover delta where the effluent appeared to disappear to ground a few meters before the training wall at E2176274 N5568182. A second Micro sample was taken for MST analysis, Samples called "Shotover delta ponding 2 woodland."
 - 109.4. the ponded effluent from where the ponding first appeared/reappeared a few meters before the training wall at E2176291 N5568144. A second Micro sample was taken for



MST analysis. Samples were called "Shotover delta ponding 3 post training wall."

109.5. the ponded effluent from where the ponding first appeared/reappeared besides a sign for the twin rivers cycle trail at E2176339 N5568055. A second Micro sample was taken for MST analysis. Samples were called "Shotover delta ponding 4 post QT trail sign."

109.6. from where the ponding ran parallel to the Kawarau River heading upstream. The discharge did not mix with the Kawarau River at this point. The location was at E2176314 N556742. Samples were called "Shotover delta ponding 5 parallel to Kawarau River."

109.7. the approximate. location of where the ponded water discharged to the Kawarau River. It was hard to determine where this occurred as the area was very open and the river was flowing into the channel as it was moving at a much faster velocity. The approx. location of this sample was E2176283 N5567914. A second Micro sample was taken for MST analysis Samples were called "Discharge to the Kawarau River."

109.8. approximately 20m downstream (d/s) of the Kawarau River from the discharge point at E2176311 N556797. A second Micro sample was taken for MST analysis Samples were called "Approx 20m D/S from discharge Kawarau River".

109.9. approximately 20m upstream (u/s) of the Kawarau River from the discharge point at E2176271 N5567889. A second Micro sample was taken for MST analysis Samples were called "Approx 20m U/S Kawarau River from discharge" as shown in Map 1 at **SLR002.**

110. All samples and sample labels were checked and grouped together. Samples were locked in two chilly bins with tamper proof tags "0385913" and "551183".



111. The seven samples taken for MST analysis taken at locations described at 104.2, 104.3, 104.4, 104.5, 104.7, 104.8, 104.9) above were dropped off at Eurofins, an analytical testing laboratory.
112. The remaining two chilly bins containing samples for standard wastewater sampling (TN, pH, TP, NH₄, TSS, TBOD₅, FC and E. coli) were dropped at the courier to go to Hills Lab. All Hills Lab (a water testing laboratory) samples and sample labels were checked and grouped together. Samples were locked in two chilly bins with tamper proof tags "551044" and "551043" and were dropped at the courier. These were tested for Sampled for TN, pH, TP, NH₄, TSS, TBOD₅, FC and E. coli.

Site visit and reduced sampling 3 December 2024

113. I revisited the Shotover Wastewater Treatment Plant (WWTP) with my colleague Richard Lord to check if the discharge from the disposal field, which was initially reported to the ORC pollution hotline on 9 November 2024, was still occurring. ORC had also decided to undertake extensive sampling again as the laboratory had not analysed the Micro samples taken 19/11/2024 to a specific count value. Unfortunately, all 10 E. coli samples were analysed incorrectly to a range of "less than 1000 CFU/100ml" instead of providing specific results. This laboratory error prevents direct compliance comparison with the consent limits. However, the results do show that E. coli levels were not high at the discharge point and did not increase across the sampled area.
114. Samples were taken from as close to the same location points as on the 19 November 2024, unless it was no longer possible due to changes on the ground and/or access/H&S issues. New GPS locations were recorded.
115. I arrived with Richard Lord at the back of the disposal field near the Shotover River, accessing the area via the public access to the Shotover Delta and cycle path without signing into the site.
116. There was still a substantial flow of wastewater discharging from the Northeast corner of the disposal field. Wastewater still flowed like a small river around the northeast side of the disposal field creating a large, ponded area in the Shotover Delta. The ponding was the worst I had seen at the site.

117. The discharge was still discharging from the disposal field via the pipe that had been installed intentionally by QLDC (or its contractor) to protect the bunded walls of the disposal field. This pipe was still discharging directly through the disposal field fenced boundary from the last "emergency pond" located in the Northeast corner of the disposal field.
118. The discharge was confirmed to still flow like a small river creating a large, ponded area in the Shotover Delta. The flow of the discharge was generally around the same as the previous 4 visits during November 2024. However, the extent had worsened and appeared to be deeper in places.
119. The wastewater flow from the disposal field had continued to scour out the ground creating an even deeper channel around the northeast corner of the disposal field. I did not step into some areas of the flow as it looked deep in places and potentially higher than my wellington boots.
120. We walked through the previously identified suspected flow path. We checked where the ponding went and whether there was still reason to suspect that the Shotover disposal field could be discharging to the Kawarau River.
121. As on previous visits most of the effluent still flowed to a wooded area of the delta and ran along the east side of the cycle path where it apparently still "disappeared" to ground a few meters before the "training wall." Refer photo at **SLR687** / Map 1 at **SLR002** The ponding in the wooded area was much more extensive than my previous 4 visits. We confirmed that the ditch/new upwelling area appeared to still discharge to the Kawarau River.
122. We returned to the back of the disposal field with sampling equipment. Richard took all the samples taken this day whilst I took photos, GPS readings and filled in the paperwork.
123. Richard took a sample from:
- 123.1. the end of the pipe which discharged from the disposal field at NZ E2176285 N5568142. A second Micro sample was taken for MST analysis. Samples called "Shotover WWTP discharge from disposal field."



- 123.2. the large, ponded area in the Shotover delta at the back of the disposal field at NZ E2176205 N5568401. A second Micro sample was taken for MST analysis. Samples called "Shotover delta ponding 1."
- 123.3. the wooded area of the Shotover delta where the effluent appeared to disappear to ground a few metres before the training wall at NZ E2176262 N5568195. A second Micro sample was taken for MST analysis. Samples were called "Shotover delta ponding 2 woodland."
- 123.4. the ponded effluent from where the ponding first appeared/reappeared a few metres before the training wall at NZ E2176294 N5568143. A second Micro sample was taken for MST analysis. Samples were called "Shotover delta ponding 3 post training wall."
- 123.5. the ponded effluent from where the ponding first appeared/reappeared besides a sign for the Twin Rivers cycle trail at NZ E2176335 N5568055. Samples were called "Shotover delta ponding 4 post QT trail sign."
- 123.6. the ponded effluent from where the ponding ran parallel to the Kawarau River heading upstream. The discharge did not mix with the Kawarau River at this point. The location was at NZ E2176315 N5567944. Samples were called "Shotover delta ponding 5 parallel to Kawarau River."
- 123.7. the ponded water discharged to the Kawarau River. It was noted that the flow from the discharge to the Kawarau River was very low. The approximate location of this sample was NZ E2176276 N5567883. A second Micro sample was taken for MST analysis. Samples were called "Discharge to the Kawarau River."
- 123.8. approximately 20m downstream (d/s) of the Kawarau River from the discharge point at NZ E2176288 N5567872. A second Micro sample was taken for MST analysis. Samples were called "Approx 20m D/S from discharge Kawarau River".
- 123.9. approximately 20m upstream (u/s) of the Kawarau River from the discharge point at NZ E2176266 N5567866. A second Micro




sample was taken for MST analysis. Samples were called "Approx 20m U/S Kawarau River from discharge" as shown on Map 1.

124. We went to the Shotover WWTP main site and logged in. Veolia staff took us to the autosampler to sample the final effluent post UV.
125. I took composite final effluent samples from the autosampler on site approx. at NZ E21757772 N5568774. Samples were called "Final Effluent Post UV Shotover WWTP."
126. I asked the Veolia operator twice if he was happy that the sample was collecting from post UV. The operator said it was. I pointed out that there was a lot of tiny invertebrates swimming in the sample and that this might imply that the UV was not working. I asked the operator if he was aware of any issues with the UV and to confirm that it was on at that time. The operator checked something a few meters away and said that it was. I would have expected that the UV would have killed anything alive in the final discharge.

Summary of site visits conducted 6 December – 16 December 2024

127. The Shotover WWTP disposal field was inspected by various ORC officers another four times between 6 December 2024 and 16 December 2024 (inclusive). Refer Table 4. I personally attended three of these subsequent visits with the last visit conducted 16 December 2024. Each visit confirmed that the discharge seen on 9 November 2024 was still ongoing. Additional samples were taken from 6 locations on 6 December 2024, 9 December 2024, 12 December 2024 and 16 December 2024, as ORC management had decided on 5 December 2024 that the discharge was to be sampled twice a week until further notice.
128. Previous sampling rounds (20 November 2024 and 6 December 2024) were extensive, covering 10 locations. To make the process more manageable, the frequency of sampling was reduced to 6 key sites, including a new sampling point post-UV treatment.
129. The other 5 samples were collected as close to the original locations from November 19, 2024, as possible, unless changes on the ground or access/health and safety issues prevented this. New GPS locations were

recorded. The following pre-existing sample locations were sampled
Refer to Map 1 at **SLR002**:

129.1. Disposal field discharge;

129.2. Ponding 2 (Woodland);

129.3. Discharge (To Kowarau River);

129.4. 20m downstream of discharge to Kowarau (D/S); and

129.5. 20m upstream of discharge to Kowarau (U/S).

130. An interpretation of these laboratory results is provided date by date as follows.

Laboratory Results from samples taken 20 November 2024

131. Results received December 3, 2024, from samples taken on 20 November 2024 also indicated the discharge from the disposal field was likely treated at the time of sampling (refer Table 5 Sample results 20/11/2024).

132. The resource consent for the Shotover WWTP (RM13.215.03) specifies limits for BOD5, TSS, TN, and E. coli prior to discharge to the disposal field. When these limits are applied to the discharge sampled at the disposal field key findings include:

132.1. TSS and TN were within with resource consent limits for the 90th percentile and 12-month rolling mean.

132.2. BOD5 levels were above the 12-month mean limit but still within compliance due to averaging.

132.3. E. coli levels were not high, with all 10 sites recording "less than 1000." Analysis to a range of "less than 1000 CFU/100ml" instead of specific colony counts/value prevent direct compliance comparison to the consent limit of 260 CFU/100ml. However, results showed low E. coli levels at the discharge point and no increase across the sampled area.

132.4. 7 locations were also sampled for Microbial Source Tracking (MST) to determine whether human effluent was present and if it

was potentially impacting the environment. (Refer Table 5 Sample results 20/11/2024).

132.5. MST laboratory results show that no human MST markers were detected at six of the seven sampled locations, including the disposal field. Refer Table 5 Sample results 20/11/2024).

132.6. One sample sample (D/S of the suspected discharge to the Kowarau River) revealed a faint detection of human MST markers, just above the limit of detection. Refer Table 5 Sample results 20/11/2024).

132.7. While these result warranted further monitoring, it's essential to interpret this MST result with caution due to the single sample and proximity to the detection limit.

133. The results suggest that it was likely the wastewater was properly treated before being discharged.

Laboratory Results from samples taken 3 December 2024

134. Laboratory results received December 17, 2024, for samples taken on 3 December 2024 also indicated the discharge from the disposal field was treated at the time of sampling (refer Table 5 Sample results 20/11/2024).

134.1. The resource consent for the Shotover WWTP (RM13.215.03) specifies limits for BOD5, TSS, TN, and E. coli prior to discharge to the disposal field. When these limits are applied to the discharge sampled at the disposal field 3 December 2024 key findings include: TSS, BOD5, E coli and TN were within the resource consent limits.

Laboratory Results from samples taken 6 December 2024

135. Unfortunately, I received notification from Eurofins Laboratory on 9 December 2024 that the samples taken 6 December 2024 had only just arrived at the laboratory that morning. This was past the 24-hour analysis window meaning that BOD, Microbiological and MST analysis could not be carried out. For this reason, analysis of the remaining parameters was cancelled.

Laboratory Results from samples taken 9 December 2024

136. Laboratory results received on December 20, 2024, for samples taken on December 9, 2024, indicated that the discharge from the disposal field



and the final effluent discharge (post UV) was treated at the time of sampling. However, neither location was within all the limits set by consent RM13.215.03 (refer to Table 5).

137. At the final effluent location (post UV), all parameters were within the limits set, except for BOD and TSS, which were both non-compliant with the annual mean limit.
138. If the limits set by consent RM13.215.03 are applied to the discharge from the disposal field on this occasion, BOD₅, TN, and E. coli were below resource consent limits. TSS was the only parameter that exceeded both limits, with a result of 101 g/m³. It is noted that an increase in TSS from the final effluent discharge to the discharge from the disposal field could be influenced by many factors, including natural ones.

Laboratory Results from samples taken 12 December 2024

139. Laboratory results received December 20, 2024, from samples taken on 12 December 2024 also indicated the discharge from the disposal field and the final effluent discharge (post UV) was fully treated at the time of sampling (refer Table 5 a). BOD₅, TSS, TN, and E. coli were fully compliant/below resource consent limits.

Laboratory Results from samples taken 16 December 2024

140. These results have not been received yet.
141. At the time of writing this document on 19 December 2024, the discharge from the disposal field was continuing to the Shotover Delta on 16 December 2024. This is a breach of EN.RMA.24.0012 for 34 days (about 1 month 7 days) continuously. From 20 December 2024 laboratory results have indicated that the discharge was treated and was not a significant environmental risk to the Shotover and Kawarau Rivers and the Shotover Delta or people using the Delta.
142. However, the discharge affects the public amenity value of the Delta.

Table 5: Summary of Laboratory sample results taken from the Discharge from the Shotover WWTP Disposal field 09/11/2024 – 16/12/2024. *(Note that analysis for samples taken 6 December 2024 was cancelled as they arrived at the laboratory too late).*




Parameter	95%ile*	Annual* Mean	Disposal Field Discharge 09/11/2024	Disposal Field Discharge 20/11/2024	Disposal Field Discharge 03/12/2024	Disposal Field Discharge 09/12/2024	Disposal Field Discharge 12/12/2024	Disposal Field Discharge 16/12/2024
BOD ₅ (g/m ³)	50	30	13	39	8	17	7	TBC
TSS (g/m ³)	50	30	25	28	12	101	14.7	TBC
TN (g/m ³)	35	23	14	17	16	18.3	16.8	TBC
E. coli (cfu/100ml)	260 (90%ile)	260 geomean	79#	< 1000	<10	79	80	TBC

**Means and percentiles apply to a rolling 12 calendar month period.*

#Please interpret this microbiological result with caution as the sample was >24 hours old on receipt at the lab.

Table 6: MST Laboratory sample results taken from the Discharge from the Shotover WWTP Disposal field 20/11/2024.

Sample Reference (20/11/2024)	Canine copies/100 ml	Avian GFD copies/100 ml	Ruminant copies/100 ml	Avian Gull4 copies/100 ml	Human HF183 copies/100 ml	Human HumM2 copies/100 ml
Shotover WWTP MST discharge from disposal field	<900	<900	<900	<900	<900	<900
Shotover delta ponding 1 MST	<900	<900	<900	<900	<900	<900
Shotover delta ponding 2 woodland MST	<900	<900	<900	<900	<900	<900

Shotover delta ponding 3 post training wall	<900	1400	<900	<900	<900	<900
Discharge to Kawarau River	<900	1100	<900	<900	<900	<900
Approx 20M D/S from discharge Kawarau River	1600	<900	<900	<900	1200*	<900
Approx 20M U/S from discharge Kawarau River	<900	<900	<900	<900	<900	<900

**Watercare laboratory advised to interpret this MST result with caution due to the single sample and proximity to the detection limit.*

Current Enforcement Summary:

143. Abatement Notice EN.RMA.21.0025 (and Infringement Notice EN.RMA.21.0024) were issued 27 May 2021 when the discharge and ponding within and outside the disposal field were fully treated and not considered an environmental or health risk. EN.RMA.21.0025 required no ponding or surface run-off of treated wastewater by August 25, 2021.
144. QLDC applied for and ORC granted multiple extensions to the compliance date EN.RMA.21.0025 so that the time for compliance eventually expired 25 August 2021.
145. From my review of ORC's records, it appears that following the issue of EN.RMA.21.0025 and EN.RMA.21.0024, ponding outside the consented area was resolved, but minor to moderate ponding within the field was never fully resolved. Until late December 2023, this ponding was within with consent discharge limits for as the effluent discharged was treated. However, operational failures affecting effluent quality, starting with odour problems, emerged in December 2023.
146. On December 27 and 28, 2023, ORC Enforcement Officers observed a significant flow of undertreated, discoloured, silt-laden, and odorous wastewater discharging through the boundary fence at the south-

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southeast corner of the Disposal Field. This flow ponded in the Shotover Delta and likely entered the Kawarau River.

147. Samples showed contaminant levels far exceeding resource consent limits, indicating a violation of multiple conditions.
148. Furthermore, it was noted by ORC that from June 2020 condition 21 (ii) became relevant: "as a result of the exercise of this consent shall not result in surface breakthrough after the initial 5-year mounding trial period following the commencement of this consent."
149. Consequently, on March 18, 2024, ORC issued Abatement Notice EN.RMA.24.0012 to QLDC.
150. In August 2024, operational issues at the Shotover WWTP led to elevated nitrogen levels and solids carryover, decreasing infiltration capacity within the gravels.
151. Around September 15, 2024, a discharge pipe was constructed to facilitate a "controlled discharge" of wastewater through the Disposal Field southern boundary fence. Veolia explained that this measure was implemented to prevent the failure of the southern wall/bund of the disposal field. This has remained in place since and all subsequent discharge outside the disposal field boundary have been via this pipe (Refer photo 1 at the end of this report).
152. The discharge beyond the disposal field boundary has continued to worsen and, treated wastewater has now been discharging continuously from the disposal field boundary for the past month.
153. The discharge is beyond the boundary is into a public recreation area used by walker, cyclists and motorcyclists. It is highly visible to the public and there has been significant media coverage of the problems in local media.



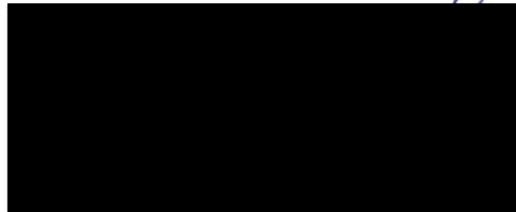
154. A solution is required to stop the continuous discharge of treated wastewater into the public recreation area.

AFFIRMED at Queenstown this
21st day of December 2024 before
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Reed



New Zealand

T. [Redacted] Surrey
Solicitor
Queenstown

Mactodd Limited
Barristers & Solicitors
Queenstown
New Zealand