Matter	Discharge consent application under s 120 of the RMA to discharge treated wastewater to ground from the Kingston Wastewater Treatment Plant
Between	**Queenstown Lakes District Council** Applicant
And	**Otago Regional Council** Consent Authority

Additional submissions of counsel for Queenstown Lakes District Council in response to the Commissioner's Minute 4

24 January 2022

MC.

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Additional submissions of counsel for Queenstown Lakes District Council in response to the Commissioner's Minute 4

May it please the Commissioner

1 Introduction

1.1 On 17 January 2022, the Commissioner issued a minute posing a number of questions for QLDC to answer. These submissions address the legal questions raised, append the evidence of the witnesses addressing the various questions and append a new set of proposed conditions. Changes made from the conditions circulated as Appendix 2 to the evidence of Mr Henderson are shown in yellow highlight.

2 Consent duration

2.1 In relation to paragraph 1.8 of counsel's legal submissions, the Commissioner asked:

> What consent durations have been imposed on other QLDC community WWTP discharge consents?

2.2 Mr Court-Patience has collated information from the Council's records. That evidence is included in Annexure 1 to these submissions.

2.3 The term of consents ranges from 12-35 years. Two of the schemes (Wanaka and Queenstown) are for much larger community wastewater reticulation and treatment schemes. The most comparable in terms of scale of the discharges are Hawea (granted for 12 years only because existing plant limits are being reached and there is no tertiary treatment), Glendhu Bay campground (granted for 35 years) and Cardrona (granted for a 35 year term to a developer, but to be handed over to QLDC).

3 Trade waste bylaws

3.1 In relation to paragraph 6.15 of counsel's legal submissions, the Commissioner asked:

> Does QLDC have trade waste bylaws (or similar) that require grease traps to be installed on the outlets of restaurants, cafes and commercial food producing facilities that discharge to QLDC reticulated wastewater systems?

3.2 QLDC has adopted the Integrated Three Waters Bylaw 2020, which came into effect on 1 July 2021. Under this bylaw, all businesses that discharge trade waste into the public wastewater network must register their business and if required, apply for a Trade Waste Consent or obtain an Approval Notice.[1]

[1] Integrated Three Waters Bylaw 2020 at cls E3.1 and E3.2, see https://www.qldc.govt.nz/media/zdcj2g4l/integrated-three-waters-bylaw.pdf.

Approval Notices are required for discharges of "Permitted Trade Waste"[2].[3] Trade Waste Consents are required for discharges of "Controlled Trade Waste"[4] and "Conditional Trade Waste"[5].[6]

3.3 Discharges of Controlled or Conditional Trade Waste are also subject to additional requirements, including those set out in cls E12 to E16 of the Bylaw.[7] Under cl E12, grease traps must be installed if the trade waste includes, or is likely to include fats, grease, or oils more than 100 grams per 1000 litres/day.[8] The occupiers must maintain and use the grease traps to a level that ensures the discharge complies with the limit for fats, oil, and grease, as set out in the Bylaw and Part E of the Administration Manual.[9]

3.4 Accordingly, QLDC's Integrated Three Waters Bylaw ensures that grease traps are installed where required.

3.5 However, as per paragraphs 6.13–6.16 of the Council's legal submissions, the activities of installing pipework and connecting premises to the wastewater reticulation network are not part of this consent and should not be the subject of conditions. To do so would potentially criminalise QLDC for failings of third parties if there were breaches of the Trade Waste Bylaw requirements.

4 Process for setting of trigger levels

4.1 In relation to paragraph 6.23 of counsel's legal submissions, the Commissioner asked:

> The suggested rewording of condition 10(a) does not enable any ORC regulatory oversight of the appropriateness of the trigger levels. Would it be appropriate to include in the conditions an ORC certification process for the trigger levels that is similar to the management plan approval process included in the FTCA conditions for the ORC consent for the Queenstown Arterial that counsel is familiar with (eg Part D conditions 31A to 33B)?
>
> If that is considered appropriate, would you please provide suitable wording?

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2 Permitted Trade Waste means a Trade Waste discharge that complies with all the physical and chemical characteristics set out in Schedule A, without the need for any pre-treatment, and does not exceed a maximum volume of trade waste of 2,000L/day (2 cubic metres/day).

3 Integrated Three Waters Bylaw 2020 at cl E3.2(a).

4 Controlled Trade Waste means a Trade Waste that complies with all the physical and chemical characteristics set out in Schedule A of the Administration Manual, after pre-treatment, and has a maximum volume of Trade Waste of no more than 2,000L/day.

5 Conditional Trade Waste means Trade Waste that does not comply with one or more of the physical and chemical characteristics set out in Schedule A of the Administration Manual and/or has a maximum volume of Trade Waste of more than 2000L/day, but which does not have any characteristics of Prohibited Trade Waste. Conditional Trade Waste Consents includes consents for Temporary Discharges.

6 Integrated Three Waters Bylaw 2020 at cl E3.2(b) and (c).

7 At cl E3.2(e).

88 Integrated Three Waters Bylaw 2020 at cl E12(c).

9 At cl E12(c)(ii).

4.2 Counsel accepts that such an approach would be helpful and is grateful for the suggestion. Suggested wording is included in the revised set of conditions as conditions 10(aa)- 10(af) included as Annexure 5 to these submissions.

4.3 The Commissioner's questions continue:

> The last sentence of condition 10(a) appears to be incorrectly drafted and its intent is unclear. From Ms Goldsmiths paragraph 6.9, I understand the intent is that the trigger levels should preclude / avoid a reduction in the current water quality state such that the water quality enters a lower NOF band. Please provide alternative wording that reflects that intent.

4.4 The intent of this sentence of the condition is as recorded in the Commissioner's question. The applicant suggests rewording this sentence to replace the word "values" with "results".

5 Monitoring report

5.1 In relation to paragraph 6.26 of counsel's legal submissions, the Commissioner asked:

> Would it be appropriate for the monitoring report required by Condition 26 to identify the need for "additional methods or improvements to the wastewater treatment and disposal system"?
>
> If so should that requirement feature in Condition 26?

5.2 Yes. Mr Henderson says so in his paragraph 13.49. This oversight is corrected in the Annexure 5 version of the conditions.

6 Review or commitment to apply for change?

6.1 In relation to paragraph 6.28 of counsel's legal submissions, the Commissioner asked:

> Should the conditions impose an obligation on QLDC to implement any "additional methods or improvements to the wastewater treatment and disposal system" that are identified in the Condition 26 monitoring report or the Condition 30 audit report?
>
> Rather than relying on an ORC s128 review of conditions, would it be more certain and responsible for the QLDC to volunteer an *Augier* condition whereby it commits to make a s127 application to change any conditions of consent that require amendment arising from implementation of "additional methods or improvements to the wastewater treatment and disposal system" that are identified in the Condition 26 monitoring report or the Condition 30 audit report?

6.2 Mr Henderson addresses this in relation to condition 30 in his material below. However, the same logic applies to both conditions 26 and 30. The important obligations are the environmental standards measured through conditions 8, 9 and 10. Recommendations made in the report provided under condition 10

must be implemented (condition 11) if they are within the scope of the consent. Logically, a s 127 application would be required if any measures went beyond the scope of the consent, or else the Council would be left non-compliant with its consent terms, or required to take expensive actions such as trucking of effluent.

6.3 Condition 26 (and it is acknowledged that there appears to be a degree of overlap between conditions10, 26 and 30) and condition 30 report on "process" matters. QLDC would likely be ill-advised to ignore any recommendations, as it may find itself in subsequent compliance strife, but it could also find other, better, more cost effective means of avoiding future issues. Experts in environmental parameters and plant components will not be best placed to make complex decisions about costs, resources and priorities. That is best left to the Council, with the environmental outcomes secured by conditions 10 and 11.

7 Questions to Mr Court-Patience

7.1 Annexure 1 to these submissions contains Mr Court-Patience's answers to the questions posed to him.

8 Questions to Mr Ellwood

8.1 Annexure 2 to these submissions contains Mr Ellwood's answers to the questions posed to him.

9 Questions to Dr Goldsmith

9.1 Annexure 3 to these submissions contains Dr Goldsmith's answers to the questions posed to her.

10 Questions to Mr Henderson

10.1 Annexure 4 to these submissions contains Mr Henderson's answers to the questions posed to him.

11 Revised conditions

11.1 A revised set of conditions with the changes made in response to these questions highlighted in yellow is provided in Annexure 5 to these submissions.

Date: 24 January 2022

Janette Campbell / Rosa Gavey
Counsel for Queenstown Lakes District Council

Annexure 1: Mr Court-Patience's answers

Responses in red

<table>
<tr><th colspan="2">Timothy Court-Patience</th></tr>
<tr><td>8.5</td><td>Will QLDC exercise its LGA 1974 s459 powers to require connection to the new scheme and if not why not?
QLDC is aware of these powers. It is one of the many tools available to us to encourage, incentivise or compel the existing township homeowners to connect to the new wastewater (and water) scheme. The Council would first enforce the consent notices on existing titles requiring property owners to connect to the community scheme within 6 months of it being available. Using the LGA powers would be a last resort.</td></tr>
<tr><td>8.12</td><td>ORC is the environmental regulator not the infrastructure service provider. If QLDC wishes existing Kingston residents to join the new wastewater scheme, is it not incumbent on the QLDC to require that under its own statutory functions rather than rely on some future regional plan change?
A future Regional Plan Change is one of the tools (as described in 8.5) to aid in compelling existing homeowners in Kingston to connect to the new wastewater scheme once available. This may come in the form of requiring monitoring of and compliance by existing systems and not permitting new onsite septic systems. Such actions would help encourage a transition to the new system, and I would imagine this would be more palatable to the community than (for example) a requirement under the LGA. Essentially, I would expect the 2 regulatory agencies to work together to achieve the goal of connecting the existing township.</td></tr>
<tr><td>1.8</td><td>What consent durations have been imposed on other QLDC community WWTP discharge consents?

<table>
<tr><th>WWTP</th><th>m3 per day</th><th>Granted</th><th>Until</th><th>Duration</th><th>Comments</th></tr>
<tr><td>Wanaka</td><td>26,400</td><td>2007</td><td>2041</td><td>34</td><td>Discharge to ground</td></tr>
<tr><td>Shotover (Queenstown)</td><td>11,238</td><td>2010</td><td>2031</td><td>21</td><td>Discharge to ground</td></tr>
<tr><td>Hawea</td><td>775</td><td>2010</td><td>2022</td><td>12</td><td>Extension to previous consent. Only 12 years as reaching plant limits and does not have tertiary treatment (UV disinfection). Overflow discharges to land while average flow discharges via pond soakage.</td></tr>
</table>
</td></tr>
</table>

	Glendhu Bay campground	190	2010	2045	35	Land application.
	Cardrona	1844	2010	2045	35	Consent for Mt Cardrona Station. Asset to be vested to QLDC in future. Very similar to Kingston design philosophy and proposed consent conditions. Cut & carry regime.

Annexure 2: Mr Ellwood's answers

Responses in red

Brian Neil Ellwood	
5.6	Do oxidation ponds (which rely on biological processes) provide sufficient wastewater treatment during the cold winter months experienced in Kingston?
	Yes, the pond loading rate (based on BOD) is based on the colder temperatures in Central Otago. The pond treatment during winter is achieved by having a lower biological loading rate in response to the colder climate. The treatment pond is designed to meet the discharge quality concentration proposed in the AEE of 50 g/m^3 for nitrogen. The negative consequences of a lower level of treatment from the oxidation pond is low for the LTA and receiving environment. For example, if there was no BOD removal, the BOD loading rate would be 360 kg BOD/d which is less than 10% of a stage 1 LTA BOD treatment capacity of 4500 kg BOD/d. Suspended solids in the discharge are expected to be stable across the year as this parameter is controlled by the mechanical filtration capacity. This also influences the UV treatment which will be designed based on the expected transmittance of the wastewater. Total phosphorus removal is achieved by physical processes of sedimentation and filtration, again with limited effects caused by changes in temperature. The LTA nitrogen loading rates assume limited treatment in the oxidation pond with an average influent concentration of 40 to 70 g/m^3 and an average 12 month effluent concentration of 50 g/m^3. Winter nitrogen removal will be dominated by sedimentation in the pond. The discharged nitrogen concentration is accounted for in the total nitrogen mass balance of 450 kg N/ha/yr. Within this mass loading, all monthly concentration measurements will contribute to the load.
5.9	Where will the Stage 2 sludge be disposed of?
	QLDC currently takes all of the biosolids from activated sludge to landfill and proposes to do the same with the sludge from this WWTP, perhaps after further treatment at the Shotover WWTP facility.
5.20 5.22	If you have based your WWTP and LTA design on a TN concentration of 20 g/m^3 (or 20 milligrams/litre) should that figure be used in Condition 16(b)(iii)?
	No, the figure of 30 g/m^3 is more appropriate. This is because the wastewater concentration is not directly essential to the LTA effects; the higher figure provides flexibility to QLDC to manage the capital investment in WWTP capacity and operational costs with investment in the size of the LTA, particularly as the influent volumes change over time. As presented in table 3.2 of the AEE and represented below.

Table 3.2: Stage 1 and Stage 2 Example Scenarios

Consent stage	Stage One: Higher BOD, and N up to 450 Lots				Stage Two: Lower BOD and N			
Treatment system	Pond	SBR	Pond	SBR	SBR	SBR	SBR	SBR
Treatment intensity	Low	Low	Low	High	Low	High	High	High
Lots	200	400	400	400	600	900	**1200**	1200
Design Flow Rate (ADWF) (m3/day)	150	300	300	300	450	675	**900**	900
Nitrogen concentration at WWTP (mg/L)	50	**30**	**50**	**20**	30	20	**20**	20
Nitrogen mass (kg/yr)	2738	3285	5475	2190	4928	4928	**6570**	6570
LTA area required to meet 450 kg N/ha (ha)	6.1	7.3	12.2	4.9	11	11	**14.6**	14.6
Hydraulic loading at minimum LTA area (ADWF) (mm/day)	2.47	4.11	2.47	6.16	4.11	6.16	**6.16**	6.16
Possible LTA area development scenario (ha)	7	**7**	**15**	**7**	12	15	**15**	21
Possible scenario hydraulic loading (mm/d)	2.14	4.29	2	4.29	3.75	4.5	**6**	4.29
Possible scenario nitrogen loading rate (kg/ha/yr)	391	469	365	313	411	329	**438**	313
Proposed Consent N loading limit (kg/ha/yr)	450	**450**	450	450	450	450	**450**	450

This table shows that there are various combinations of N output from the pond/above ground plant and the size of the LTA that will all deliver the proposed consent N limit of 450 kg/ha/yr.

I view the WWTP output parameter concentration conditions as an intermediary step and are necessary as a check on the treatment system processes but are not essential to the overall treatment train and management of the land application discharge effects. The key conditions are influencing the effects are the hydraulic and nutrient loading rates, with nitrogen being the most limiting factor and this controlling the LTA field size.

It is my opinion the flexibility provided by the higher WWTP concentration allows QLDC to more efficiently manage the capital investment in the future. Higher WWTP standards could unnecessarily increase capacity and operational costs as the further treatment achieved in the LTA is not factored in.

6.3	Will tertiary filtration be utilised in Stage 1?
	Yes all discharged water will be filtered and have UV treatment.
6.24	Should your last sentence (increasing the size of the LTA if required) be reflected in the consent conditions?
	No, it is my opinion that this is too prescriptive and a combination of WWTP functioning (eg heating of wastewater to ensure better biological action, carbon dosing to increase denitrification capacity) and LTA area increase or the altered operational management of each as provides QLDC the ability to respond to changing environmental conditions. Conditions 10, 11 and 30 d) secure environmental outcomes and provide the opportunity to identify and present

	remedial actions that align with identified causes. .
6.41	Are you referring here to the setback distances in Condition 3(b)(v) which Mr Henderson has recommended be deleted?
	No, in this paragraph I am referring to the buffer zones that must be established as required under Condition 4 (unfortunately I have used buffer zones interchangeably with setbacks).
8.12 8.28	Given you reference to ammoniacal nitrogen in paragraph 8.28, should the Stage 1 discharge limits (Condition 16(a)) include a limit for ammoniacal nitrogen? I note this is routinely the case for oxidation pond reliant WWTPs in the North Island that I have consented. If so, what should that limit be?
	No additional specification is required, because ammoniacal nitrogen is included in the total nitrogen balance discharging to the LTA, NH_4^+ is a beneficial form of nitrogen to apply to land as the positive charged molecule is reasonably well held via adsorption in the soil matrix for later use by plants. Typically ammoniacal nitrogen limits are in place where there is a direct discharge to surface water to protect aquatic organisms to avoid due to ammonia toxicity. Because this project does not involve any direct discharge to water, it is my view that no such condition is necessary here.
8.24	If a WWTP failure occurs during wet weather (which seems more likely than not) then only 12 hours of emergency storage volume would be available (given that the system design has a wet weather peaking factor of 2). Given the staffing issues that QLDC laments elsewhere (in relation to monthly monitoring frequencies), is 12 hours a long enough time to identify and fix any problem causing the WWTP failure?
	I consider 12 hours at peak flow is adequate and that QLDC will be able to manage the call out times with appropriate contractual requirements for the operation of the plant
8.30	What is the statistical difference between a rolling 12 month mean and compliance with 8 out of 12 samples within a 12-month period? Which is more conservative?
	The 12 month mean is slightly higher than a 50th percentile and the 8 in 12 is a 66.7th percentile. The rolling mean is different from a percentile as it accounts for the magnitude of the values. The rolling mean is more conservative as it accounts for the magnitude of all test results, however either system can be implemented and will not change the predicted level of effects from the LTA as this is based on a "must not exceed" loading rate for nitrogen of 450 kg N/ha/yr. This loading rate uses daily flows and monthly nitrogen concentration to calculate the load applied. The conditions have recommended 8 in 12 samples based on the project team experience with ORC's preference for this type of arrangement for monitoring instead of rolling means. I would be happy for either approach to be used, as either approach provides some flexibility, missing from the recommended conditions in the s 42A report.
8.39	Please provide condition wording that implements your recommendations.
	At paragraph 8.39 of my evidence, I recommend deleting the reference to Ksat and replacing conditions 25(c)(ii) and (iii) with a visual soil assessment. Those changes were not picked up in Mr Henderson's proposed conditions of consent. I consider that the following changes should be made: ~~12 25 (c) At the application depth, soil must also be tested for:~~ ~~13 i. in situ infiltration capacity (Ksat) at the application depth;~~ ~~14 ii. indications of oxidation reduction potential (gleying) of the~~

	~~soil;~~ ~~15 iii. an infield assessment of soil structure~~ c) At each soil sampling site undertake a Visual Soil Assessment (VSA) in accordance with the methodology provided in the OMM required under Condition 28 d) Condition 28(d) requires that monitoring requirements and procedures are established in the OMM.
Condition 10(a) – should there also be groundwater quality trigger levels and if so: ▪ for which constituents should they be developed and ▪ can you and Mr Henderson please draft suitable condition wording?	
Yes, this would provide a useful management tool to predict changes in the existing groundwater quality once the discharge from the LTA commences. Mr Henderson has incorporated "Groundwater" into the generation of triggers levels for the same parameters as at the tributary monitoring sites The third sentence of the condition should be amended to include "groundwater and", prior to the words "tributary monitoring sites". It might be clearest to reference the sites shown in the Schedule, in which case sites GW1, GW2 and GW3A and GW3B would be relevant.	

Annexure 3: Dr Goldsmith's answers

Responses in red

Ruth Johanna Goldsmith	
6.1	What is the environmental benefit of monitoring water quality in the small, land-locked artificial farm pond (site SW6)?
	There is none.
6.2 – 6.3	Can you please provide wording for a consent condition that particularises the monitoring regime for your recommended mid-lake monitoring site, including depth-integrated sampling?
	As a condition that is fit for the present time, I would recommend: "The surface water quality monitoring method employed at site SW12 (Lake Wakatipu mid-lake) shall generally align with that used by the Otago Regional Council at their 'Wakatipu Open Water' site. Water sample collection shall follow the depth-integrated sampling method specified within the most recent version of the National Environment Monitoring Standards (NEMS) document "*Water Quailty Part 3 of 4: Sampling, Measuring, Processing and Archiving of Discrete Lake Water Quality Data*"." However, I would prefer that this matter could be addressed through the Operations and Management Manual, which requires that monitoring requirements and procedures be set out and "updated as appropriate" (condition 28(d)).

Annexure 4: Mr Henderson's answers

All condition numbers refer to the suite of conditions attached as Appendix 2 to the evidence of Ralph Henderson.

Paragraph	Question	Response
Ralph Robert Henderson		
7.42	What system modifications did you have in mind?	The system modifications I had in mind were those identified on page 5 of the Section 92 response from LEI dated 11 June 2021. These identify the potential to achieve a higher quality of effluent prior to discharging to the LTA through modifications such as heating, aeration or carbon dosing.
7.50	Has QLDC provided such financial assistance in other situations that you are aware of?	I am not aware of QLDC currently providing financial assistance to individual ratepayers in communities where new systems are being established at present. However, I am aware that this has been considered in relation to the provision of these services for the communities of Kingston and Glenorchy. The other new WWTPs which have been consented more recently (such as Cardrona and Gibbston) are more developer led or replacing existing underperforming systems.
7.108	Are you referring here to the setback distance in Condition 3(b)(v)(7) which you have recommended be deleted?	Paragraph 7.108 refers to Condition 4 which requires the establishment of a native riparian vegetation buffer of a width of 10 metres between the permanent wetland or pond and any LTA dripper line within 15 metres. If this condition is not considered sufficiently clear the following amendment to Condition 4 proposed in my evidence could be adopted: "Waterbody buffer zones must be established and maintained as follows: a) If LTA dripper lines are located within 15 metres from any permanent wetland or pond, the consent holder must, prior to the application of wastewater ~~establish and maintain a native riparian vegetation buffer of a width of 10 metres between the permanent~~

Paragraph	Question	Response
		~~wetland or pond and the nearest Land Treatment Area dripper line;~~: i. <u>ensure a dripper lines are a minimum of 10 metres from the permanent wetland or pond</u> ii. <u>establish and maintain a native riparian vegetation buffer in the 10 metres between the LTA and the permanent wetland or pond;</u> b) Prior to application of wastewater any specific 'zone' of the LTA ephemeral ponding areas must be identified and the consent holder must establish a 5 metre non-irrigated buffer around any ephemeral pond; and c) The buffers must be maintained and any plantings that die must be replaced with native plantings in the next available planting season.
7.117	Having regard to Mr Ellwood's evidence, are there six groundwater monitoring sites proposed or three? Having regard to Ms Goldsmith's evidence, are there eight surface water monitoring sites proposed or seven?	Based on the evidence of Mr Ellwood there will be three groundwater monitoring sites. Based on Dr Goldsmith's evidence there are eight surface water monitoring sites. The number of surface water monitoring sites could be reduced to seven if monitoring site SW6 at the pond is not utilised as discussed in relation to paragraph 6.1 of Dr Goldsmith's evidence above. A new map will be attached to the conditions to reference the monitoring sites.
7.129	Do the recommended conditions do that? If not, can you please draft an appropriately worded condition(s)?	Regulation 12(1) requires the consent authority to consider whether the activity to which the application relates may itself lead to an event occurring that may have a significant adverse effect on the quality of the water at the point of abstraction, or as a consequence of an event, such as heavy rainfall, have a significant adverse effect on the quality of the water at the point of abstraction.

Paragraph	Question	Response
		The inclusion of conditions to notify registered drinking water holders of the occurrence of any event described in Regulation 12(1) is only required if such circumstances apply. I have considered whether the activity may lead to an event occurring that may have a significant adverse effect on the quality of water at the point of abstraction by the registered water supply, or whether the consequence of an event may have a significant adverse effect on the quality of water. The evidence of Mr Ellwood is that the discharge from the LTA would not affect the registered water supply under normal operations and as the application is a subsurface discharge even in the event of heavy rainfall or saturated soils an overland flow from the site to a surface water body is not possible.[10] The registered drinking water supply is a groundwater take and is upgradient from Kingston Creek into which any discharge from the WWTP would flow in the event of a catastrophic failure at the plant or oxidation pond. Having considered the effects of the activity and the effects of the consequences of a significant event on the quality of water I do not consider that the proposal will be likely to affect the registered water supply in either circumstance and therefore a condition requiring notification is not required.
7.139	Are you referring here to Condition 4(a)?	Yes
13.6	Can you please further explain your rational for omitting the reference to 450 connections given that your recommended Condition 16 relies on that figure?	Mr Ellwood has clarified to me that his concern in relation to Condition 3.a).ii and iii was that the wording of the conditions could preclude the early upgrade of the WWTP to activated sludge technology prior to the 451 number being met. Legal counsel has confirmed that the current wording would not preclude early provision of

[10] Evidence of Mr Ellwood.

Paragraph	Question	Response
		the activated sludge technology. Having clarified this, our proposed wording for Condition 3(a).iii would now be: ~~"Sequence batch reactor~~ activated sludge technology that provides tertiary level treatment, a calamity pond, sludge buffer tank, and sludge dewatering as described in the application and shown in Appendix 1 when there are 451 or more connections (Stage 2);"
13.9	Mr Ellwood does not address Condition 3(a)(iv) (the flow meter) in his paragraph 8.24?	Correct. It is my view that Condition 3(a)(iv) duplicates the requirements of Condition 12 without providing any additional value to the requirements for flow metering established by that Condition. I consider that Condition 3(a)(iv) does not add any value and should be deleted for clarity.
13.11	Rather than deleting the requirement for an alarm, would it be more prudent to require a telemetered alarm to be installed that provides remote notice to QLDC of any WWTP or LTA system failure?	The Applicant intends that the system be monitored via telemetry and that this system would include an alarm. Condition 3(a) could be amended to include: "A telemetered alarm shall be established to signal high water levels."
13.17	What is meant by the "details of each LTA zone" in your Condition 5(c)?	I consider the details of each LTA zone would include: the location of the LTA zone and the area of dripper lines within the LTA zone. These could be used to determine and the maximum capacity that could be discharged into the LTA zone. However, details such as the duration and daily frequency of discharges to each LTA zone cannot be established prior to commissioning the LTA and are anticipated to vary in response to the operational requirements of the WWTP. I suggest that condition 5(c) be reworded to provide: "(c) the location of each irrigation zone of the LTA and the area of dripper lines within each zone;"

Paragraph	Question	Response
13.30	Would it be more appropriate for the QLDC to indicate within the assessment report required under Condition 10 that they will implement any remedial actions identified and specify within that report the proposed timing of those remedial actions?	Condition 11 requires a response to any exceedance of contaminant concentrations that are identified under Condition 10. I consider that it is more appropriate that any requirement of this nature be included in Condition 11. The report required under condition 10 will inevitably be provided by an external consultant who will not be familiar with practical matters (such as funding, resourcing and prioritisation with other works) that the applicant will need to factor into its decision as to timing. I consider the inclusion of a timeframe in which these amendments will be undertaken is reasonable and recommend the following amendment to Condition 11: "Should the results of the assessment undertaken in accordance with Condition 10 (b) identify that the exceedance(s) in contaminant concentrations are attributable to the discharge activity, and adverse effects on water quality or aquatic ecology are occurring, then within 20 working days the Consent Authority must be provided with confirmation that the remedial actions set out in the report prepared in accordance with Condition 10(b) will be undertaken <u>and the timeframe within which these will occur,</u> provided they are within scope of the consent."
13.36	Do mean "most probable number"?	Yes – I recommend the reference in measurement of Escherichia coli in Condition 16(a)(v) and 16(b)(v) be amended to refer to the most probable number.
13.57	Do you mean Condition 30(b)? Would it be more appropriate for Condition 30(b) to refer to achievement of the discharge quality limits imposed under Condition 16?	Yes paragraph 13.57 should refer to condition 30(b) not 31(b). I do not consider it is appropriate for Condition 30(b) to refer to the discharge quality limits imposed under Condition 16. Condition 16 imposes limits part way through the treatment process, ie at the end of treatment by the mechanical plant and prior to

Paragraph	Question	Response
		treatment through land. The point of condition 30 is to evaluate the performance of the system as a whole, ie the mechanical components of the plant together with the disposal through land, and with the use of the cut and carry system to remove nutrients from the catchment. The audit provides an assessment of the treatment train for nutrient management over a longer term (5 yearly basis) as well as through Conditions 22, 23 and 26(i) and (j).
13.58	Would it be appropriate to impose an obligation on QLDC to implement any "changes, upgrades or remedial works" identified by the Condition 30 audit? In that regard should there be a condition requiring the QLDC to submit a report or memorandum detailing their proposed timing for implementing any "changes, upgrades or remedial works" identified by the Condition 30 audit concurrently with their submission of the audit report to ORC?	I do not consider further obligations on QLDC to implement any changes, upgrades or remedial works identified by Condition 30 audit are required. Conditions 10 and 11 require reporting of the results of monitoring information and the implementation of remedial action if environmental standards are breached. Condition 37(c) can also require the consent holder to adopt the best practicable option to remove or reduce adverse effects on the environment arising from the exercise of this consent.
▪ Condition 7(b) – is this necessary given that the monitoring bores are already in place? ▪ Conditions 23(a) and (b) – should these refer to the reticulated wastewater system specifically associated with this discharge consent?		In relation to Condition 7(b): These bores have already drilled and the information identified under Condition 7(b) will have been provided as part of the bore consent process. I therefore recommend deleting Condition 7(b). In relation to Condition 23(a) and 23(b): I consider amending Condition 23(a) and 23(b) to refer to reticulated wastewater infrastructure specifically associated with Discharge Permit RM20.164 would be an improvement. The amendment to the proposed condition 23 would be as follows: 23. The nitrogen mass balance calculated in accordance with Condition 22 must not exceed: a) 1,050 kg N/year prior to the connection of any existing

Paragraph	Question	Response
	▪ Condition 25(b)(vi) – Mr Ellwood recommended omitting total carbon (his paragraph 8.38). Do you disagree with that? ▪ Condition 26(e) – what do you mean by "unexpected effects"? Is that a term that can be consistently interpreted and enforced? Would this be better linked to exceedance of the condition 10 'trigger levels'?	properties within Kingston (as at the date of consent) to a reticulated wastewater system <u>specifically associated with Discharge Permit RM20.164 and</u> managed by Queenstown Lakes District Council; or b) 1,050 kg N/year plus an additional 5.2 kg N/year for every connection of an existing property within Kingston (as at the date of consent) to a reticulated wastewater system <u>specifically associated with Discharge Permit RM20.164 and</u> managed by Queenstown Lakes District Council; and I accept with Mr Ellwood's recommendation to remove Total Carbon and therefore recommend this be deleted from Condition 25(b). The application documents address the effects and mitigation measures necessary to reduce contaminants discharged through the proposed activity consented by RM20.167. As originally proposed Condition 26(e) effectively requires such an assessment to occur every 12 months. The proposed amendment seeks to recognise this by acknowledging the that the discharge permit consents the discharge of contaminants and associated effects, but monitoring under Condition 26(g) should focus on a level of effects beyond what has been considered through this process. If greater clarity is required proposed condition 26(e) could be further amended as follows: (e) Groundwater, surface water and soil sampling and analysis of any

Paragraph	Question	Response
		effects above trigger levels ~~effects predicted by the Applicant~~, including identification of any effects and any mitigation measures necessary to reduce unexpected contaminants; and

Annexure 5 - Amended conditions from s 42A Report

The conditions from the Section 42A Report have been reproduced here with track changes showing amendments. Additions are shown underlined and deletions ~~struck through~~.

Substantial changes responding to questions from Commissioner are shown highlighted in yellow.
Minor changes to correct numbering, typographical errors, or amendments for the purpose of clarity are shown highlighted in green.

Specific

1. The discharge of treated wastewater to land from Kingston Township must be carried out in accordance with the plans and all information submitted with the application, detailed below, and all referenced by the Consent Authority as consent number RM20.164:
   a) Application form, and assessment of environmental effects dated May 2020.
   b) Further information response cover letter dated 16 March 2021;
   c) Further information memorandum by Lowe Environmental Impact dated 15 March 2021;
   d) Memorandum dated 11 June 2021 by Lowe Environmental Impact dated 11 June 2021; ~~and~~
   e) Email correspondence dated 23 June 2021 from Brian Ellwood; and
   e~~)~~f) Evidence presented on behalf of the Consent Holder at the hearing on 26 January 2022.

   The evidence in (f) above presented the most up to date version of the application and supersedes the earlier documents. If there are any inconsistencies between the above information and the conditions of this consent, the conditions of this consent will prevail.

2. ~~treated municipal wastewater from Kingston Township onto the area shown in Map 1 attached to this consent and as shown in the application for consent dated May 2020.~~ The discharge must be managed so that:
   a) The maximum volume of wastewater discharged must not exceed 1,800 cubic metres per day.
   b) The rate of application does not exceed 12 mm per day in any ~~part~~ zone of the disposal area over a rolling 7 day average.
   c) The average daily total volume over a rolling 30-day period must not exceed 900 cubic metres per day.

3. The key components of the wastewater treatment plant (WWTP) and land treatment area (LTA) must be consistent with those described in the application; as shown on the attached plant schematic drawing in Appendix 1 and must comprise at least the following minimum, or additional, components, dimensions and standards:
   a) ~~Wastewater treatment system~~WWTP:

~~i. Grease traps must be installed at the outlets of all restaurants, cafés and commercial food producing facilities connecting to the wastewater treatment system;~~

~~ii.~~i. tertiary level treatment and oxidation pond as described in the application ~~and shown in Appendix 1 for up to 450 connections~~ (Stage 1);

~~iii.~~ii. ~~sequence batch reactor~~activated sludge technology that provides tertiary level treatment, a calamity pond, sludge buffer tank, and sludge dewatering as described in the application and shown in Appendix 1 when there are 451 or more connections (Stage 2);

~~iv. A wastewater discharge flow meter must be installed for both Stage 1 and 2;~~

~~v. An audio/visual alarm system must be incorporated for both Stage 1 and 2; and~~

iii. Emergency storage volume, equivalent to 24 hours average dry weather ~~peak~~ flow volume, above the high water alarm levels, within the ~~wastewater treatment system~~WWTP for both Stage 1 and 2.

~~vi.~~iv. A telemetered alarm shall be established to signal high water levels.

b) Wastewater ~~land treatment area~~LTA:

i. ~~A~~a minimum of ~~7.5~~5 hectares of ~~land disposal area~~ LTA must be provided for Stage 1 and a minimum of 15 hectares must be provided ~~for Stage 2~~at maximum capacity;

ii. at least 25 hectares of total ~~land disposal area~~ LTA must be available for the discharge;

iii. subsurface pressure compensating drip irrigation buried to a depth greater than ~~200~~ 150 millimetres below the ground surface;

iv. dripper lines at a maximum of 1 metre spacing and emitters spaced at a maximum of 0.6 metre centres;

~~v. the disposal area must be located in accordance with the approved plans, and must be:~~

~~1. a minimum distance of 10 metres from roadside drains;~~
~~2. a minimum distance of 50 metres from surface water bodies;~~
~~3. a minimum distance of 50 metres from subsurface and stormwater drains;~~
~~4. a minimum distance of 20 metres from property boundaries;~~
~~5. a minimum distance of 50metres from any bore (except monitoring bores);~~
~~6. a minimum of 5 metres from any ephemeral pond;~~
~~7. a minimum of 10 metres from any wetland and pond; and~~

~~vi.~~v. Mmanaged by a cut and carry management regime ~~designed and managed in a way~~ that maximises plant uptake and removal of nutrients from the site.

4. Waterbody buffer zones must be established and maintained as follows:
a) If ~~land treatment area~~ LTA dripper lines are located within 15 metres from any permanent wetland or pond, the consent holder must, prior to the application of wastewater~~: establish and maintain a native riparian~~

~~vegetation buffer of a width of 10 metres between the permanent wetland or pond and the nearest Land Treatment Area dripper line;~~

i. ensure a dripper lines are a minimum of 10 metres from the permanent wetland or pond; and

~~i.~~ii. establish and maintain a native riparian vegetation buffer in the 10 metres between the LTA and the permanent wetland or pond.

b) Prior to application of wastewater any specific 'zone' of the LTA the ~~discharge area~~LTA, ephemeral ponding areas must be identified and the consent holder must establish a 5 metre non- irrigated buffer around any ephemeral pond; and

c) The buffers must be maintained and any plantings that die must be replaced with native plantings in the next available planting season.

5. Prior to commissioning the treatment and disposal system, the Consent Holder must supply the Consent Authority with a Producer Statement 4, Code Compliance Certificate or Certificate of Acceptance, certifying that the treatment and disposal system has been installed in accordance with Condition 3. These must include, but are not limited to, the following ~~for the new stage~~:

a) ~~P~~plans of the treatment system ~~described~~ required by in Condition 3 of this consent;

b) ~~P~~plans of the land treatment area clearly showing all the irrigation zones;

c) The location of each irrigation zone of the LTA and the area of dripper lines within each zone ~~details of the area of each zone, the maximum volumes of wastewater discharged to each zone (litres per second), and the duration (hours) and daily frequency of each application to the zones~~;

d) ~~C~~confirmation that the total installed and operational ~~land treatment area~~LTA is sufficient to meet the maximum application rate in Condition 2 for the total commissioned treatment plant capacity: and

e) ~~P~~photographs of each of the new irrigation zones.

6. Prior to commissioning the treatment and ~~land treatment areas~~disposal system, the ~~land treatment areas~~LTA must be marked out by any means that ensures ~~the~~ its extent is identifiable on the ground surface and must remain marked out for the duration of the consent. The ~~land treatment areas~~LTA must not be used:

a) For roading whether sealed or unsealed;

b) As a hardstanding area;

c) For erecting buildings or any non-effluent systems structures;

d) For activities that require intensively managed grass surfaces (e.g. grass tennis courts or bowling greens or golf tees and greens);

e) For grazing stock~~, excluding sheep~~; and

f) No vehicle must park or drive over the disposal field ~~except for the purpose of harvesting and planting with the exception of harvest~~ for the cut and carry operation and for maintenance.

Performance Monitoring

7. Prior to commissioning the treatment and disposal system, ~~the discharge commencing~~ the Consent Holder must establish a water quality monitoring network by:
   ~~a)~~ Installing groundwater monitoring wells in the locations identified in the attached monitoring bore location plan attached as Map ~~2~~1;
   ~~b)~~a) ~~Once installed, the bore locations and reference levels should be surveyed, and borelogs and bore construction details must be submitted to the Consent Authority confirming location, depth, groundwater levels and geology;~~ and
   b) Establishing surface water monitoring sites in the locations identified in the surface water sampling location plan attached as ~~Map 3~~Map 1 ~~and as identified in the Aquatic Ecology Assessment by Ryder Environmental Ltd dated November 2020~~. A water level staff must be surveyed at the following locations to ~~each site to~~ enable water level measurements during each survey:
      i. Tributary of Kingston Creek - at the culvert located near SW4.
      ii. Unnamed tributary - at the culvert near SW3 and at the culvert near SW7.
      ~~iii. Pond near SW6 - a water level staff must be installed in a stable location towards the northern end of the pond.~~
   c) The surface water monitoring method undertaken at site SW12 (Lake Wakatipu mid-lake) will be in accordance with the methodology provided in the OMM required under Condition 28 d).

8. Representative surface water and groundwater samples must be taken or overseen by a suitably qualified professional from the monitoring network established in Condition 7. All samples must be collected in accordance with AS/NZS 5667.11:1998. Groundwater and surface water samples must be analysed for the following parameters:
   a) Temperature;
   b) pH;
   c) Dissolved oxygen;
   d) Electrical conductivity;
   e) Chloride;
   f) Escherichia coli (E.coli);
   g) CBOD5;
   h) Total suspended solids;
   i) Nitrate+Nitrite nitrogen (NNN);
   j) Total ammoniacal nitrogen (NH_4-N); and
   k) Total Kjeldahl Nitrogen (TKN)
   l) Dissolved reactive phosphorus (DRP)
   m) Total Phosphorus

   Note: Temperature, pH, Dissolved oxygen, and electrical conductivity should be measured in the field with a calibrated water quality meter. Groundwater and surface water levels should be recorded at the time of sampling.

9. Samples must be collected and analysed under Condition 8 with the following frequency:
   a) For the purposes of establishing a baseline of existing effects, groundwater and surface water monitoring must be undertaken every two ~~monthly~~ months for at least 12 months prior to the discharge

~~commencing~~commissioning of the treatment and disposal system, including at least one sample that represents a wet weather event.

b) Following the commissioning of the ~~wastewater~~ treatment and disposal ~~system plant and land treatment areas~~, groundwater and surface water monitoring should be conducted in February, April, July, and October each year, unless more frequent monitoring is required as specified in the report prepared under 10(a).

Note: A wet weather event for the purposes of Condition 9(a) means one sampling event that is taken on the day of or the day following when rainfall in the preceding 24 hr period has exceeded 10 mm.

10.

~~Within one month of collecting all baseline monitoring data in accordance with Condition 9 (a), a report of the results and an interpretation~~interpreting of ~~the results must be prepared and submitted to the Consent Authority. The report must be prepared by a suitably qualified and experienced person. The report must propose appropriate trigger levels and the trigger levels must be approved by the Consent Authority.~~

a) Within three months of collecting all baseline monitoring data in accordance with Condition 9 (a), a report interpreting the results must be prepared by a suitably qualified and experienced person. The objective of the report is to set trigger levels for:
(i) nitrate-nitrite nitrogen;
(ii) dissolved reactive phosphorus;
(iii) ammoniacal nitrogen; and
(iv) Escherichia coli
at groundwater and tributary monitoring sites, and trigger levels for
(i) total nitrogen;
(ii) total phosphorus;
(iii) ammoniacal nitrogen; and
(iv) Escherichia. coli
at the Lake Wakatipu monitoring site (all as shown in Map 1).

aa) The purpose of the trigger levels is to identify if adverse effects that warrant further investigation may be occurring. The establishment of trigger levels must take into account the baseline monitoring data, and relevant Regional Plan Water for Otago Schedule 15 and NPS-FM Appendix 2A limits. When setting triggers levels consideration should be given to the monitoring timeframes over which the relevant Schedule 15 and NPS-FM limits apply. The trigger levels should be set so that ~~values~~ results that reflect a reduction in the NPS-FM attribute band baseline for a monitoring site amount to a trigger.

ab) A draft version of the report prepared in accordance with Condition 10 must be provided to Aukaha, Te Ao Marama Incorporated and the Kingston Community Association Incorporated, and a period of at least 20 working days shall be allowed for consultation with these parties, and for feedback to be provided by these parties on the contents of the report. The final version of the report shall set out how any issues raised by Aukaha, Te Ao Marama Incorporated or the Kingston Community Association Incorporated have been incorporated, and where they have not, outline the reasons why.

ac) The final version of the report prepared in accordance with Condition 10(a) must be submitted to the Consent Authority to certify the trigger levels are appropriate for determining if adverse effects that warrant further investigation

may be occurring. The report must be submitted at least 20 working days prior to commissioning the treatment and disposal system.

ad) If the Consent Holder has not received a response from the Consent Authority within 20 working days of submitting the report for certification, the report prepared in accordance with Condition 10(a) shall be deemed to be certified.

ae) If the Consent Authority's response is that they are not able to certify the report they must provide the Consent Holder with reasons and recommendations for changes to the report in writing. The Consent Holder must consider any reasons and recommendations of the Consent Authority and resubmit an amended report for certification.

af) If the Consent Holder has not received a response from the Consent Authority within 5 working days the amended report shall be deemed to be certified.

b) The results of all samples taken in accordance with Condition 9(b) must be compared to the trigger levels presented in the report under Condition 10(a). Should the results exceed the trigger levels, an assessment, including further sampling as required, must be undertaken to determine whether the exceedance(s) are attributable to the discharge, and identify any potential adverse effects on water quality or aquatic ecology associated with the exceedances. The ~~report~~ assessment must also identify any immediate or longer-term remedial action that will be implemented.

c) The Consent Authority must be notified within 5 working days of the exceedance being identified and must be provide a copy of the assessment within ~~30~~ 40 working days.

11. Should the results of the assessment undertaken in accordance with Condition 10 (b) identify that the exceedance(s) in contaminant concentrations are attributable to the discharge activity, and adverse effects on water quality or aquatic ecology are occurring, then within 20 working days the Consent Authority must be provided with confirmation that the remedial actions set out in the report prepared in accordance with Condition 10(b) will be undertaken and the timeframe within which these will occur, provided they are within scope of the consent.

12.

a) Prior to commissioning the ~~land treatment area~~LTA, the consent holder must install a flow meter and datalogger on the outlet pipe from the treatment system to record the volume of effluent discharged to the ~~land treatment area~~LTA. The flow meter must have an accuracy range of +/- 5%.

b) Once the flow meter and datalogger is installed, the consent holder must measure and record the daily volume of effluent discharged to the ~~land treatment area~~LTA.

c) The flow records must be forwarded to the Consent Authority with the annual report required under Condition 26 of this consent, and upon request. Data must be provided electronically giving the date, time and flow rates in no more than 15-minute increments of water and the datalogger downloaded annually and sent to Council with the annual report required under Condition 26 of this consent.

13. The Consent Holder must provide written verification to the Consent Authority that the discharge flow meter has been verified as accurate by a suitably qualified person by 31 July of the first year of the exercise of this consent and then at five-yearly intervals thereafter.

14. Prior to commissioning the treatment and disposal system~~LTA~~, the consent holder must establish adequate facility and access for wastewater quality sampling, such as a hand operated tap/valve that is on the outlet pipe from the treatment system before the wastewater discharges to the ~~land treatment area~~LTA.

15. Samples of treated wastewater prior to discharge from the tap/valve installed under Condition 14 must be collected on any one day of each month following the commissioning of the ~~wastewater treatment plant~~ WWTP and ~~land treatment area~~LTA and analysed for the following parameters:
    a) pH;
    b) Electrical conductivity;
    c) Chloride;
    d) BOD5;
    e) Total suspended solids;
    f) Nitrate+Nitrite nitrogen (NNN);
    g) Total ammoniacal nitrogen (NH_4-N); and
    h) Total Kjeldahl Nitrogen (TKN)
    i) Dissolved reactive phosphorus (DRP)
    j) Total Phosphorus
    ~~j)~~k) E.coli

    Note: Total Nitrogen can be calculated by the sum of NNN and TKN.

16.
    a) If the number of connections to the waste-water treatment plant (WWTP) is less than 450, the ~~results~~ samples collected under Condition 15 must not exceed the following limits in more than 8 out of 12 consecutive samples:
        i. 50 milligrams per litre of biochemical oxygen demand (5 day);
        ii. 30 milligrams per litre of total suspended solids;
        iii. 50 milligrams per litre of total nitrogen;
        iv. 10 milligrams per litre of total phosphorus;
        v. 10,000 ~~colony forming units~~ most probably~~e~~ number per 100 millilitres of Escherichia coli (rolling 12-month geometric mean).
    b) If the number of property connections to the WWTP is ~~greater than~~ 450 or greater the ~~results~~ samples collected under Condition 15 ~~of this consent~~ must not exceed the following limits in more than 8 out of 12 consecutive samples:
        i. 20 milligrams per litre of biochemical oxygen demand (5 day);
        ii. 30 milligrams per litre of total suspended solids;
        iii. 30 milligrams per litre of total nitrogen;
        iv. 10 milligrams per litre of total phosphorus;
        v. 10,000 ~~colony forming units~~ most probably~~e~~ number per 100 millilitres of Escherichia coli (rolling 12-month geometric mean).

17. In the event of one or more of the limits set out in Condition 16 being exceeded, the Consent Holder must resample and/or retest that parameter to confirm the exceedance within 5 working days. In circumstances where one or more of the limits set out in Condition 16 are exceeded on two consecutive sampling occasions and these results are confirmed exceedances (i.e. it is not due to faulty testing or other parameters affecting the results), the Consent Holder must report to the Consent Authority as follows:
    a) The Consent Authority must be notified within 48 hours of any confirmed exceedance; and
    b) This notification must include advice of any corrective actions taken by the Consent Holder.
    c) An incident report must be provided to the Consent Authority within 20 working days of the notification of the exceedance. This report must include:
    i. identification of the likely cause of the limit exceedance;
    ii. the effects on the receiving environment likely to arise because of the limit exceedance;
    iii. the management responses undertaken, or which may be necessary to prevent any further limit exceedances occurring;
    iv. remedial action undertaken or which may be necessary and confirmation of implementation if the action required does not require resource consent.

18. The Total Nitrogen loading of the ~~land treatment area~~LTA must not exceed 450 kg N/ha/yr.

    ~~*Advice Note: The Land Treatment Area loading rate of 450 kg N/ha/yr is calculated based on the daily flow data collected under Condition 12 multiplied by the Total Nitrogen concentration sampling collected under Condition 16 of this consent and divided by the land treatment area.*~~

~~Olsen P of the land treatment area must not exceed 40mg/L for any samples as measured under Condition 24(b).~~

~~In the event any of the samples under Condition 24(b) of Olsen P limit has been exceeded, the Consent Holder must report to the Consent Authority as follows:~~

~~a) The Consent Authority must be notified within 48 hours of any confirmed exceedance; and~~

~~b) This notification must include advice of any corrective actions taken by the Consent Holder.~~

~~c) An incident report must be provided to the Consent Authority within 20 working days of the notification of the exceedance. This report must include:~~

~~i. identification of the likely cause of the limit exceedance;~~

~~ii. the effects on the receiving environment likely to arise because of the limit exceedance;~~

~~iii. the management responses undertaken, or which may be necessary to prevent any further limit exceedances occurring;~~

~~iv. remedial action undertaken or which may be necessary and confirmation of implementation if the action required does not require resource consent.~~

19.

a) During every grass/lucerne harvest event from the ~~land treatment area~~LTA, the consent holder must:
   i. obtain one composite sample of grass for every five hectares of the ~~land application area~~LTA harvested. A composite sample must consist of ten samples of cut grass
   ii. analyse the composite samples for total nitrogen ~~and total phosphorus~~ content;
   iii. record the weight of grass harvested in kilograms of dry matter; and
   iv. use the data obtained under Conditions 21(a)(ii) and 21(a)(iii) to determine the kilograms of nitrogen ~~and phosphorus~~ per hectare exported from the ~~land application area~~LTA via the cut and carry system.

b) The results of this analysis must be presented in the annual report required under Condition 26 of this consent.

20. The consent holder must annually calculate the nitrogen mass balance to provide an estimate of the mass of nitrogen lost to groundwater from the ~~land treatment area~~LTA as follows:
   a) Calculate the total nitrogen applied to land each year less the total nitrogen removed by harvesting each year;
   b) The total nitrogen applied to the ~~land treatment area~~LTA must be calculated on a monthly basis using the total volume of wastewater applied that month multiplied by the concentration of total nitrogen sampled from the waste water treatment plant discharge in the same period less ammonia volatilisation (5% of the applied nitrogen) and less denitrification (10% of applied nitrogen).
   c) The total nitrogen applied to the ~~land treatment area~~LTA for the yearly reporting period is the sum of total nitrogen in Condition 22(b)
   d) The Total Nitrogen removal by harvesting grass or lucerne from the ~~land treatment area~~LTA each year must be estimated by obtaining dry matter content and total nitrogen content after each crop/plant harvest in accordance with Condition ~~22~~21(a).

21. The nitrogen mass balance calculated in accordance with Condition 22 must not exceed:
   c) 1,050 kg N/year prior to the connection of any existing properties within Kingston (as at the date of consent) to a reticulated wastewater system specifically associated with Discharge Permit RM20.164 and managed by Queenstown Lakes District Council;~~1,050 kg N/year while existing properties (as at the date of the consent) within Kingston have septic tanks discharging to the ground~~; or
   d) 1,050 kg N/year plus an additional 5.2 kg N/year for every connection of an existing property within Kingston (as at the date of consent) to a reticulated wastewater system specifically associated with Discharge Permit RM20.164 and managed by Queenstown Lakes District Council~~1,050 kg N/year plus 5.2 kg N/year for every existing property that has been connected and conveyed to the WWTP~~; and

e) The results of the nitrogen mass balance calculation must be presented in the annual report required under Condition 26 Of this consent.

22.

~~23.~~ Ecological assessments of the surface water quality sampling sites established under Condition 7, ~~(c)~~ and shown on Map 1,~~3~~ must be undertaken following the sampling methodology in the Aquatic Ecology Assessment report prepared by Ryder Environmental Ltd dated November 2020 to provide a baseline of effects. Within three months of the assessment a report of the results and an interpretation of the results must be prepared and submitted to the Consent Authority. The report must be prepared by a suitably qualified and experienced person. The assessments should be completed~~:~~

~~24.~~ on any day of October in the first year following the commissioning of the ~~wastewater treatment plant~~ WWTP and ~~land treatment area~~LTA~~; and~~

~~on any day of October if exceedance(s) in contaminant concentrations have occurred that are attributable to the discharge activities under Condition 11.~~.

~~25.~~23. An assessment of the soil conditions must be undertaken by a suitably qualified and experienced practitioner ~~on an annual basis~~every two years. The assessment must include:

a) Four soil samples must be collected at random from within the ~~Land Treatment Area~~LTA at the following depths:
   i. 0 -20 cm;
   ii. 30 – 50 or at the application depth; and
   iii. iii. 80 – 100 cm

b) The four soil samples from each depth must then be composited and analysed for the following:
   i. Exchangeable Cations (Sodium, Potassium, Magnesium, Calcium);
   ~~ii. Exchangeable Sodium Percentage;~~
   ~~iii.~~ii. ~~-~~Olsen P;
   ~~iv.~~iii. Total Phosphorus
   ~~v. P retention (anion storage capacity)~~
   ~~vi.~~iv. Cation exchange capacity;
   ~~vii.~~v. Base saturation;
   ~~viii. Total carbon;~~
   ~~ix. Organic Matter;~~
   ~~x.~~vi. Total Nitrogen;
   ~~xi. Available Nitrogen;~~
   ~~xii.~~vii. pH; and
   ~~xiii.~~viii. Suite of seven heavy metals (Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Zinc) every 5 years.

c) At each soil sampling sites undertake a Visual Soil Assessment (VSA) in accordance with the methodology provided in the OMM required under Condition 28 d).~~At the application depth, soil must also be tested for:~~
   ~~i. in situ infiltration capacity (Ksat) at the application depth;~~
   ~~ii. indications of oxidation reduction potential (gleying) of the soil;~~
   ~~iii. an infield assessment of soil structure~~

d) A control site must be chosen outside of the ~~Land Treatment Area~~LTA, and samples collected and tested in accordance with Conditions 25~~7~~(a), 25~~0~~(b), and 25~~0~~(c).

e) The results of the soil assessment must be submitted to the consent authority within the annual report required under Condition 26.

~~26.~~24. Every 12 months following the date ~~of commencement of the discharge~~the commissioning of the treatment and disposal system a monitoring report must be prepared relating to the activities authorised by this consent over the preceding ~~-~~calendar year. This report must be prepared by a suitably qualified person and must include, but not be limited to:

a) Maintenance service records and malfunctions or breakdowns and the corrective action taken;

b) Flow monitoring records;

c) Discharge sampling and analysis;

d) Copies of all analytical sample results collected under Conditions 8, 15, 21 and 25 of this consent;

e) Groundwater, surface water and soil sampling and analysis any effects above trigger levels~~of unexpected effects when compared to effects predicted by the Applicant~~, including identification of any effects and any mitigation measures necessary to reduce unexpected contaminants; and

f) Maintenance service report and recommendations for improvements in the system;

g) A comparison of wastewater quality and quantity results from the past calendar year with the results of the previous year and identification of any trends;

h) Overview of compliance with all conditions of this consent including the OMM;

i) Details of nitrogen balance including the number of existing septic tanks in Kingston that are connected to the ~~wastewater treatment plant~~WWTP;

j) Details of the cut and carry operation including the number of harvests, mass harvested, dry matter nitrogen and phosphorous concentration;

k) The number of connections to the ~~waste water treatment plant~~WWTP; and

l) A summary of any complaints received.

~~27.~~

25.

a) The report required by Condition 26 must be provided to the Consent Authority, Aukaha and Te Ao Marama Incorporated, within one month of its preparation. ~~certified by the Consent Authority and identify if there is a need to implement additional methods or improvements to the wastewater treatment and disposal system. All recommendations specified in the report and within scope of the consent must be implemented.~~

~~a)~~b) The report required by Condition 26 must be provided to the Kingston Community Association Incorporated, at its registered office address. The Consent Holder shall advise the Kingston Community Association Incorporated that it may request clarification of any of the technical details in the annual report to assist the community

understanding of the operation of the treatment and disposal system in writing within 20 working days of receiving the annual report.

~~28.~~26. Prior to commissioning the treatment and land disposal system, the consent holder must prepare and forward to the Consent Authority, Aukaha and Te Ao Marama Incorporated, an Operations and Management Manual (OMM) for the treatment and land disposal system to ensure its effective and efficient operation at all times. The system must be operated in accordance with this manual at all times [unless required by other conditions of this consent which prevail over the manual], which must be updated as appropriate. The OMM must be to the satisfaction of the Consent Authority and include, as a minimum:

a) A brief description of the treatment and disposal system, including a site map that shows the location of the treatment system, discharge locations, sampling sites and the drainage network;

b) The date the discharge will commence;

c) Key operational matters including weekly, monthly and annual maintenance checks;

d) Monitoring requirements and procedures;

e) A management plan for the cut and carry operation including procedures for harvesting grass or lucerne from the site and for maximising ~~grass~~ growth and nitrogen and phosphorus uptake by ~~grass~~ the crop such as soil tests and pest and weed control.

~~f) A representative farm nutrient balance/budget for the land treatment area inclusive of wastewater applications;~~

~~g)~~f) Contingency plans in the event of system malfunctions or breakdowns (including provision for the removal and disposal of effluent by tanker truck should there be prolonged system failure);

~~h)~~g) The means of receiving and dealing with any complaints;

~~i)~~h) Key personnel and contact details; and

~~j)~~i) Emergency contact phone numbers

~~29.~~27. All discharges must comply with the certified OMM at all times. A copy of the certified OMM must be held on-site at all times.

~~29. Prior to the commissioning of the treatment and land disposal system, a maintenance service contract must be forwarded to the Consent Authority, which provides for the servicing of the treatment and disposal system at least once every 12 months, must be entered into with a suitably qualified person/organisation. A maintenance service contract must be maintained for the duration of the consent. Any updates must be provided to the Consent Authority. Following every service, a written report must be prepared, and a copy provided to the Consent Authority with the annual report required under Condition 25 of this consent.~~

~~30.~~28. An audit of the condition, operation and performance of the ~~wastewater treatment~~ WWTP and ~~land disposal system~~LTA must be undertaken by a

suitably qualified professional every 5 years following commencing the discharge. The audit must include:

a) An assessment of the condition of the ~~wastewater treatment~~WWTP and ~~land disposal system~~LTA~~.~~,

b) An assessment of the adequacy of the system to treat and dispose the consented wastewater volume and ~~maximise~~ ensure removal of nutrients to the level predicted in the application~~.~~

c) An up to date list of the component of the ~~wastewater treatment system~~WWTP and ~~land disposal system~~LTA~~.~~

d) Recommendations including timeframes for any changes, upgrades, or remedial works to the ~~treatment~~ WWTP and ~~land disposal system~~ LTA or process.

~~30.~~29. A copy of the audit report must be provided to the Consent Authority no later than 30 working days after the assessment is undertaken.

~~31. All recommendations specified in the audit report and within scope of the consent must be implemented to ensure the efficient and safe operation of the wastewater treatment system and disposal field.~~

General

~~32.~~30. The discharge of wastewater to land must not result in:

a) Ponding of wastewater within or adjacent to the ~~land disposal area~~LTA;

b) Channelling of wastewater that results in overland runoff of wastewater beyond the ~~land disposal area~~LTA;

c) Surface seepage (breakout) of wastewater ~~within or~~ beyond the ~~land disposal area~~LTA;

d) Odour emission ~~resulting~~ from the ~~treatment~~ WWTP and ~~disposal system~~ LTA that is offensive or objectionable to such an extent that it has an adverse effect on the environment beyond the boundary of the property on which the consent is exercised;

e) Discharge of sludge ~~of~~ or grease to land or water~~; and~~.

~~f) Vehicle access over any part of the land disposal area except during harvest and for maintenance.~~

~~35. The wastewater treatment and land disposal system must be maintained in good working order at all times and in accordance with the operations and management manual as required under Condition 28.~~

~~36. All discharges must comply with the certified OMM at all times. A copy of the certified OMM must be held on-site at all times.~~

~~33.~~31. In the event that an unidentified archaeological site is located during works, the following will apply;

a) Work must cease immediately at that place and within 20 metres around the site~~;~~.

b) All machinery must be shut down, the area must be secured, and the Heritage New Zealand Pouhere Taonga Regional Archaeologist and the Consent Authority must be notified~~.~~

c) If the site is of Maori origin, the Consent Holder must also notify the appropriate iwi groups or kaitiaki representative of the discovery and ensure site access to enable appropriate cultural procedures and tikanga to be undertaken, as long as all statutory requirements under legislation are met (Heritage New Zealand Pouhere Taonga Act 2014, Protected Objects Act 1975)~~.~~

d) If human remains (koiwi tangata) are uncovered the Consent Holder must advise the Heritage New Zealand Pouhere Taonga Regional Archaeologist, NZ Police, the Consent Authority and the appropriate iwi groups or kaitiaki representative and the above process under (c) will apply. Remains are not to be disturbed or moved until such time as iwi and Heritage New Zealand Pouhere Taonga have responded~~.~~

e) Works affecting the archaeological site and any human remains (koiwi tangata) must not resume until Heritage New Zealand Pouhere Taonga gives written approval for work to continue. Further assessment by an archaeologist may be required.

~~34.~~32. If this consent is not given effect to within a period of ~~5~~ 10 years from the date of commencement of this consent, this consent ~~must~~ lapse~~s~~ under Section 125 of the Resource Management Act 1991.

Review

~~35.~~33. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent, for the purpose of:

a) Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or which becomes evident after the date of commencement of the consent; or

b) E~~e~~nsuring the conditions of this consent are consistent with any National Environmental Standards, Regulations, relevant plans and/or the Otago Regional Policy Statement; or

c) R~~r~~equiring the consent holder to adopt the best practicable option, in order to remove or reduce any adverse effect on the environment arising as a result of the exercise of this consent.

d) Reviewing the frequency of monitoring or reporting required under this consent;

e) Amending the monitoring programme ~~set out in accordance with Conditions 7-33~~.

Appendix 1 – Wastewater treatment plant schematic drawing

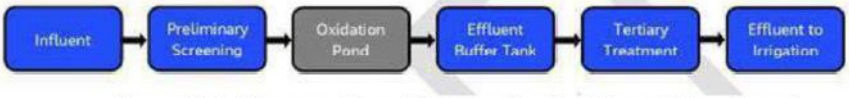


Figure 3.1: Process Flow Diagram for the Stage 1 Treatment

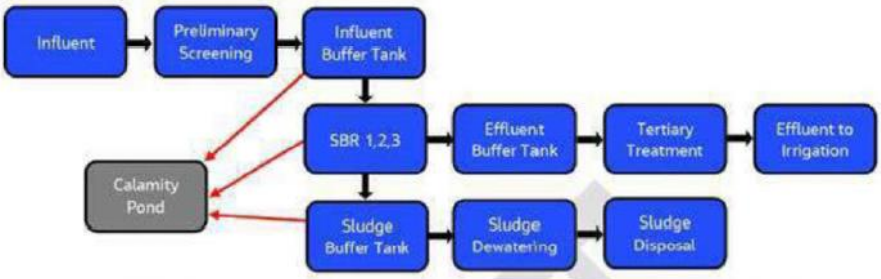
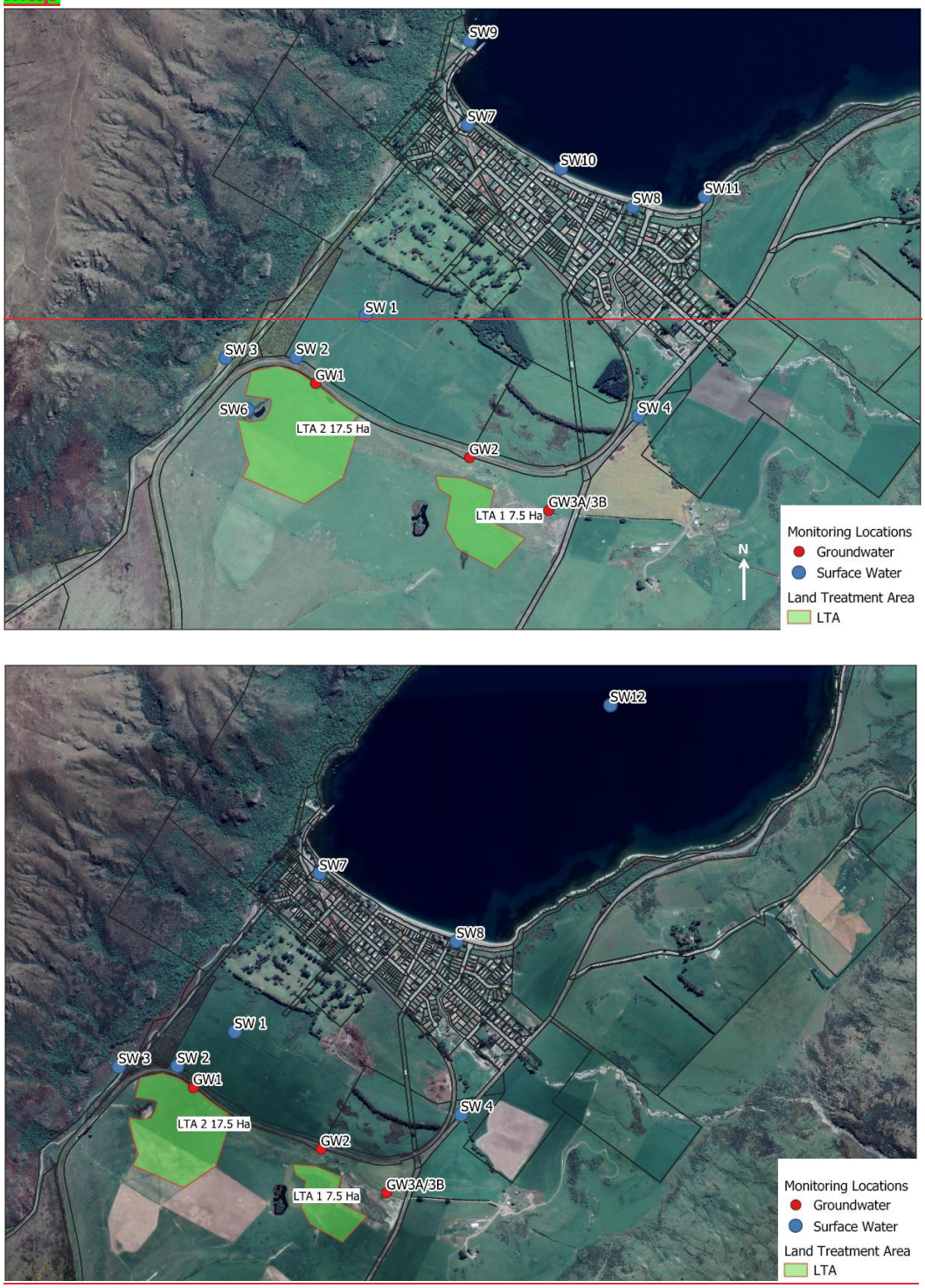


Figure 3.2: Process Flow Diagram for Stage 2 Ultimate Plant Design

Appendix 2 – Groundwater and surface water monitoring location Map



Map 1: Groundwater and surface water monitoring locations