Memorandum

To: Otago Regional Council From: Keri Johnston

RE: RM25.407.01 – s128 Technical Review Date: 20 October 2026

Purpose

This memo responds to ORC's 28 September 2026 review scope for discharge permit RM25.407.01, held by SJ Allen Holdings Limited at Brown Road, Lauder.

Executive Summary

The activity is practicable only if the consent conditions and certified Operations and Management Manual (OMM) are strengthened. The current controls do not provide sufficient assurance that:

- application rates will match realistic crop uptake, given that WAS is unstabilised and releases nitrogen more quickly than the biosolids the current limit is modelled on;
- wetlands, water races, ephemeral and intermittent waterways, critical source areas (CSAs) and other runoff pathways will be protected;
- localised loading from winery wastewater and trenches will be controlled; and
- monitoring results will trigger timely investigation and action.

The main recommended change to the consent limits is to reduce the maximum single application of WAS from 600 kg N/ha to 300 kg N/ha, while keeping a cumulative maximum of 600 kg N/ha over any three-year period. This halves the peak nitrogen release without reducing the site's overall capacity.

The site visit on 16 October 2026 confirmed that the land is predominantly flat. Slope-related risk is therefore limited and largely confined to the creek margins, storage ponds and gully areas already identified in the application. However, ephemeral and intermittent waterways and CSAs are present across the farm and are not identified in the application, OMM or Environmental and Nutrient Management Plan, and the irrigation race is unbunded over large parts of the farm where it follows a natural watercourse. It was also advised that irrigation will no longer be used on the property, so crop yield and nitrogen removal assumptions need to reflect dryland conditions. These need to be reflected in the mapping, setbacks and block-specific nutrient assessments.

Scope and Information Reviewed

This review considers the consent, application and AEE, section 92 response, recommending report, certified OMM Version 03, Babbage review, September 2026 Environmental and Nutrient Management Plan, volunteered conditions, Overseer report and available waste analyses.

A site visit was undertaken on 16 October 2026 with Nicole Mesman (e3 Scientific) and ORC staff. No discharge was occurring at the time because rainfall earlier in the week had made conditions unsuitable

for spreading, which indicates that weather and ground-condition restrictions are being applied in practice. The site visit record is provided in Appendix 2.

Excluded from this memo. The spring, the permitted water take at [redacted], groundwater effects, and related monitoring and mitigations are being addressed separately by Nicole Mesman of e3 Scientific. Whether additional resource consents are required is also outside this review.

Responses to ORC's Questions

Question i – practicality of complying with conditions 1-10 and the OMM

ORC question. *Taking into account the nature of the activity and environmental characteristics of the site, is it practicable for the activity to be undertaken in accordance with Conditions 1–10 and the OMM? In relation to nitrogen management under Conditions 2 and 11(c): (a) can a suitable crop reliably be established; and (b) is a crop likely to take up the nitrogen resulting from annual discharges?*

Answer. The activity is practicable, but the maximum authorised nitrogen loading will not necessarily be agronomically suitable for every block or every year. Crop establishment and nitrogen uptake depend on the timing of application, soil temperature and moisture, irrigation, drainage, crop choice and the length of the growing season. Central Otago's cold winters and short shoulder seasons restrict plant growth and nitrogen demand for part of the year. Where waste is applied before a crop is actively growing, or where establishment is delayed by cold, wet or dry conditions, nitrogen may be mineralised before the crop can use it. Imperfectly drained or slowly permeable soils may further restrict root growth and even access to the site, while increasing the risk of ponding, runoff or nitrogen loss. Soils also vary across the site; the excavations inspected near the current discharge area showed a gravellier profile than expected, which is likely to hold less water and drain more freely. A suitable crop can therefore be established, but reliable establishment and effective uptake cannot be assumed solely because land is available for planting.

The 600 kg N/ha limit should be treated as an absolute ceiling, not a standard application rate. The limit of 600 kg N/ha per application, with a three-year return period, mirrors the three-year averaging approach in the NZ Biosolids Guidelines (NZWWA, 2003), which equates to 200 kg N/ha/year. However, that approach was developed for stabilised biosolids, of which only about 10% of total nitrogen is expected to become available each year. WAS is not stabilised. The applicant assumes 40% first-year release, or about 240 kg N/ha from a single 600 kg N/ha application. That is well above the likely uptake of a dryland oat crop, which is in the order of 100–150 kg N/ha. A single application of 300 kg N/ha would release about 120 kg N/ha in the first year, which is more closely matched to realistic crop demand. Allowing two applications of up to 300 kg N/ha within any three-year period would keep the same cumulative loading, and therefore the same overall site capacity, while halving the peak nitrogen release. Even so, the rate for each block should still be set by assessment. A technically defensible rate should be set for each block and application using:

- verified waste dry-solids and nitrogen concentrations;
- the proportion and timing of plant-available nitrogen;
- previous loadings;
- relevant soil nitrogen information;
- realistic crop establishment and yield; and
- the amount of nitrogen expected to leave the site through harvest.

This is necessary because the application assumes an oat yield of 10 t DM/ha, but no site harvest or crop nitrogen data have been provided to demonstrate that the yield is achievable. Even if it is achieved, nitrogen removal depends on the nitrogen concentration of the harvested material and whether that material leaves the site. Nitrogen in roots, stubble or an unharvested crop may return to the soil during decomposition, while grazing returns a substantial proportion of consumed nitrogen to the block. Waste nitrogen also becomes plant-available at different rates, so repeated applications can create a residual soil nitrogen pool where crop yield or nitrogen removal is lower than assumed. Linking the discharge rate to demonstrated crop demand and removal provides a clearer basis for avoiding nitrogen accumulation and loss.

The modelled increase in nitrogen concentration in drainage indicates that, under the modelled assumptions, some applied nitrogen is expected to move below the effective root zone rather than be taken up by the crop. Before relying on the result quantitatively, ORC should confirm the Overseer model inputs and assumptions for:

- waste nitrogen form and availability;
- crop yield and uptake;
- irrigation;
- rainfall;
- soil properties;
- drainage; and
- waste application timing and previous nitrogen loading.

The result remains directly relevant to whether the authorised loading is sustainable and whether the proposed crop-management regime is likely to contain nitrogen within the application area.

The risk of nitrogen loss can continue after waste application has stopped. Where land is bare, crop establishment fails, or growth is slow, plants may take up little nitrogen. Meanwhile, nitrogen already applied in the waste can continue to be released as the organic material breaks down, provided temperature and moisture conditions allow.

This breakdown initially releases nitrogen as ammonium, which soil microbes can then convert to nitrate. If plant uptake is insufficient, nitrate can accumulate in the soil. Unlike some other forms of nitrogen, nitrate is not strongly held by the soil. A later rainfall or irrigation event that causes drainage can carry it below the crop's roots, potentially producing a relatively concentrated pulse of nitrate in drainage water.

Rewetting after a dry period, or warmer conditions, can also stimulate the release and conversion of nitrogen before a crop is growing strongly enough to use it. Further waste application to the same bare or poorly growing area adds to the nitrogen supply without a matching increase in plant uptake.

A large application followed by limited crop growth and later drainage therefore provides a credible pathway for a short period of elevated nitrate concentration in drainage. Whether this occurs, and its magnitude, depends on nitrogen release, crop uptake and the timing and amount of drainage.

The significance of the Overseer model result depends on its inputs. The proposed model removes irrigation entirely, which is consistent with the advice at the site visit that irrigation will no longer be used on the property. However, the model also assumes an oat yield of 10 t DM/ha and a much higher plant-available water storage than the baseline (79 mm compared with 25 mm). Under dryland conditions, with annual rainfall of approximately 510–545 mm and the gravellier soil profile observed near the current discharge area, both assumptions are likely to be optimistic. If crop yield is lower, or the soil holds less water than modelled, predicted crop uptake will be overstated and predicted drainage understated.

Because the land will not be irrigated, crop establishment and yield will depend on rainfall and stored soil moisture. Establishment is more likely to be delayed or to fail in dry seasons, and the assumed yield and nitrogen removal should be reviewed for dryland conditions. If irrigation is reintroduced on any block, the block-specific assessment should be updated and irrigation included in the soil-water balance, because application when the profile is already wet may initiate drainage and mobilise accumulated nitrate.

Recommended changes.

- Limit each application to the lower of 300 kg N/ha or the rate justified by the block assessment.
- Count all nitrogen-containing discharges and repeat applications to the same area.
- Apply a cumulative maximum of 600 kg N/ha over any three-year period, with no more than two applications to the same area. A second application should only occur after crop uptake and soil mineral nitrogen have been checked, unless a different period and cumulative limit are demonstrated through the block-specific nutrient assessment to provide equivalent or better environmental protection.
- Require records of crop establishment, yield, harvest and the amount of nitrogen removed from the application block. Where a crop is grazed rather than harvested, the block assessment must account for nutrient returned in dung and urine and must not treat total crop uptake as nitrogen removal from the site.
- Base the block-specific nutrient assessment on dryland crop yields and nitrogen removal. If irrigation is reintroduced on any block, record irrigation applications and include irrigation and drainage in the nutrient and water balance for that block.

Question ii – adequacy of measures described in the application

ORC question. *Do Conditions 2–10 and the OMM adequately avoid, remedy or mitigate the actual or potential adverse effects described in the application? If not, what other measures are required?*

Answer. The controls provide a useful base but are not adequate in several material respects. This conclusion is based on the way the wastes are applied, the variable receiving environment, and the reliance on management procedures that do not always include measurable limits or clear response triggers. The nitrogen limit is not linked to verified waste composition, plant or soil available nitrogen, previous applications, realistic crop demand or actual nutrient removal off the property. This creates a risk that nitrogen will accumulate in soil or be lost where crop establishment or yield is lower than assumed. The site also includes imperfectly drained or slowly permeable soils, cold-season conditions and potential flow paths to wetlands, water races and surface water. Although the land is predominantly flat, which limits rapid overland flow, flat ground is more prone to ponding, and the ephemeral and intermittent waterways and CSAs observed during the site visit provide pathways where runoff can concentrate during wet periods. Under wet, frozen or runoff-prone conditions, infiltration and soil storage

are reduced, increasing the likelihood of ponding, overland flow, sediment movement and contaminant transport. These risks cannot be managed reliably without defined soil and weather restrictions and site-verified exclusion areas. Winery wastewater and trench disposal create a separate risk because repeated discharge to a confined area can impose high local hydraulic and organic loads even where site-wide annual limits are met. This can lead to soil saturation, anaerobic conditions, odour, seepage or breakout. Unstabilised waste activated sludge (WAS) may contain viable microorganisms and has variable nutrient and contaminant concentrations. Incorporation reduces direct contact and exposure pathways but is not, by itself, a stabilisation or treatment process. Source-specific testing and a risk-based stock and forage withholding protocol are therefore required, with the testing suite and withholding period justified by the waste source, treatment process, application method and intended land use. The main gaps are the absence of a crop-responsive nitrogen rate, unclear controls for unsuitable soil and weather conditions, incomplete mapping of wetlands, ephemeral and intermittent waterways, CSAs and connected runoff paths, inadequate control of localised wastewater and trench loading, and limited controls for unstabilised waste activated sludge.

Additional measures required.

- Prohibit discharge where the ground is waterlogged, ponded or frozen, or where observed rainfall, forecast rainfall, soil moisture and site conditions indicate that the discharge is likely to cause ponding, runoff or drainage beyond the application area. The condition or OMM must specify the forecast period, rainfall threshold or decision method used for the pre-application assessment.
- Require a recorded pre-application soil moisture and weather check.
- Site-check and map natural wetlands, active races, ephemeral and intermittent waterways, CSAs, connected runoff paths and excluded slopes, and include them on the application area maps before further discharge occurs.
- Exclude CSAs and ephemeral flow paths from discharge, with a buffer distance specified in the OMM, and keep these areas in vegetated cover where practicable. ORC should also confirm whether intermittent waterways meeting the RMA definition of a river are subject to the 50 m setback for natural surface watercourses in Condition 6(d).
- State winery wastewater limits directly in the consent, including 24 mm per application, 170 kg N/ha/year, cumulative passes and the existing rainfall restriction.
- Define trench capacity, cover and stop-discharge criteria.
- Require source-specific testing, including representative dry solids and mercury results, and assessment of any new or materially changed waste source.
- Require a justified grazing and forage withholding protocol for unstabilised WAS.

Question iii – effects on the permitted water take at [redacted]

ORC question. *Do Conditions 2–10 and the OMM adequately avoid, remedy or mitigate effects on the nearby permitted water take? If not, what other measures are required?*

Answer. This question is being addressed separately by Nicole Mesman of E3 Scientific. E3's conclusions and recommended groundwater and permitted-take protections should be incorporated into the final consent recommendations and checked for consistency with the setbacks, monitoring requirements and action triggers proposed in this memo. During the site visit it was advised that a third monitoring bore is planned near the current discharge area (Figure 1, Appendix 2); its location, depth and construction should be confirmed with e3. The two excavations inspected showed a gravellier soil profile than expected, with

no groundwater encountered to approximately 3 m depth. e3 attended the site visit and these observations are relevant to its assessment.

Question iv – adequacy of monitoring conditions 11-26

ORC question. *Are Conditions 11–26 adequate to accurately monitor actual or potential effects, including groundwater generally and the permitted water take?*

Answer. The current monitoring framework is useful but is not sufficient to demonstrate sustainable loading or provide reliable early warning of adverse effects. Groundwater and permitted-take monitoring are addressed separately by E3 Scientific. For the remaining effects, the principal weaknesses are sample representativeness, monitoring duration, verification of actual loading and the absence of defined action triggers. Sampling must represent the range of soils, waste types, loading rates, application areas and receiving environments; convenient or limited sampling may miss localised nutrient accumulation, soil deterioration or contaminant movement. Monitoring must also continue long enough to detect cumulative or delayed changes in soil nutrients, salts, metals, soil structure and surface-water quality. Representative waste analyses, application records and mapped treated areas are needed to relate measured effects to the nutrients and contaminants applied. Finally, the conditions must define thresholds for investigation, ORC notification, further sampling, suspension, corrective action and recommencement. The regime should demonstrate both compliance with consent limits and whether the receiving environment is responding as expected.

Recommended changes.

- Require representative dry solids and nitrogen analysis so actual loading can be calculated.
- Require application maps and records showing source, quantity, area, passes and calculated nutrient loading.
- Continue quarterly upstream and downstream surface-water monitoring for five years, revisit sites recorded as dry, sample ephemeral and intermittent waterways draining treated areas when they are flowing and undertake targeted sampling after observed runoff where safe.
- Require representative annual nutrient and soil-structure checks through the first three rotation years, including the winery wastewater area.
- Retain longer-term soil chemistry and metals monitoring, with increased frequency where a trigger or limit is approached.
- Define numeric limits, baseline departures or trend criteria that trigger investigation, ORC notification, confirmatory sampling, suspension, corrective action and recommencement. The conditions should also specify who assesses the trigger, the timeframe for each response, and the evidence required before discharge recommences.

Question v – OMM measures that should be consent conditions

ORC question. *Would any mitigation measures in the approved OMM be more appropriate as conditions of consent?*

Answer. Yes. Measures that set a material limit, exclusion, monitoring obligation or response requirement should be stated directly in the consent conditions. These safeguards define the authorised scale, location

and circumstances of the discharge, how effects will be measured, and what action is required if performance is not as expected. Including them in the consent provides a clear and enforceable basis for compliance and prevents critical safeguards from being weakened through a later OMM update. The OMM should instead contain the procedures used to comply with those requirements, including staff responsibilities, inspection methods, record forms and equipment checks. This distinction allows operating procedures to improve without reducing the level of environmental protection required by the consent.

The following should be conditions:

- maximum and cumulative nitrogen-loading rules, return periods and repeat application controls;
- wetland, surface-water, ephemeral and intermittent waterway, CSA, race, slope and any confirmed water-take exclusion areas;
- restrictions for waterlogged, frozen or runoff-prone conditions;
- winery wastewater depth, annual nitrogen and rainfall restrictions;
- monitoring frequency, duration, analytes and action triggers;
- critical storage, transfer, trench and waste-incorporation requirements; and
- any groundwater or water-take protection measure confirmed by E3.

An OMM change should require ORC certification before implementation where it alters:

- an application method;
- a waste source or acceptance criterion;
- an exclusion area;
- a loading calculation;
- a monitoring location or method;
- a mitigation measure;
- a response trigger; or
- any procedure that could materially change the nature, scale or location of the discharge or its environmental effects.

Question vi – odour and dust

ORC question. *Is compliance with Condition 28(d) for odour feasible, and are additional controls needed for dust?*

Answer. Compliance with the odour condition appears feasible, but only if odour is actively managed from receipt through to incorporation into the soil. Odour risk is greatest where WAS remains stored for extended periods, has a high organic load or has become anaerobic, and during transfer, spreading and incorporation when a larger surface area is exposed. Warm, still conditions can increase odour generation and reduce dispersion, while winds towards nearby properties can carry odour beyond the site. Covered, sealed bins limit exposure during transport and temporary storage; minimising storage time reduces the opportunity for further anaerobic decomposition; and prompt spreading and incorporation reduce the exposed surface area and duration of emissions. Pre-application checks should therefore consider waste condition, storage time, temperature, wind direction and wind speed, with spreading deferred where off-site odour is likely.



The available information does not set clear acceptance criteria for abnormal, highly odorous or long-stored loads, maximum holding times, complaint response, or when work must stop. Without those controls, compliance relies heavily on operator judgement and may only be tested after an off-site effect has occurred. The OMM should include load-rejection criteria, maximum storage periods, weather checks, stop-work requirements, complaint investigation and corrective actions.

Dust arising directly from the authorised waste handling, spreading, incorporation and associated vehicle movements should be controlled through clear operational requirements, subject to ORC confirming that those requirements are within the scope of this discharge consent. The controls should maintain ground cover where practicable, limit cultivation to what is necessary, avoid soil disturbance during strong or adverse winds, control vehicle speeds and stabilise exposed areas promptly. Work should be modified or stopped where visible dust crosses the property boundary or is likely to affect nearby receptors.

Recommended changes.

- Apply odour and dust outcome standards to all authorised wastes and associated handling.
- Require no offensive or objectionable odour or dust beyond the property boundary.
- Require work to stop or be modified where odour, visible dust drift or adverse wind conditions create an off-site effect.
- Require complaints, investigations and corrective actions to be recorded and reported.

Question vii – water race, hardstand, and slopes

ORC question. *Are additional measures needed for the water race, is a hardstand required for depositing WAS before spreading, and does the OMM adequately address land steeper than 15 degrees?*

Water race. The site visit confirmed that the race is not bunded for large parts of the farm, where it follows a natural watercourse. Along these reaches runoff from adjacent treated land can enter the race directly, and the race should be treated as a natural surface watercourse with the 50 m setback in Condition 6(d) applied. Where the race is a constructed channel, the existing 5 m setback may be adequate where site inspection and checks of the spreading equipment demonstrate that waste will not be deposited into the race and runoff from treated land will not enter it. The assessment should consider where the race carries water, including any connections to Clear Creek, tributaries, wetlands or downstream users. Where these pathways cannot be adequately controlled within 5 m, a wider setback or additional runoff controls are required.

Hardstand. A contained, impermeable and cleanable transfer area is appropriate wherever WAS is deposited, transferred or bins are held before spreading. WAS has a high moisture and organic content, and any leakage, spillage or drainage from bins can create a concentrated contaminant load over a small area. On bare soil or an unsealed surface, liquid can infiltrate before it is detected or recovered, while rainfall can mobilise spilled material and carry nutrients, microorganisms and organic matter to adjacent land, drains or water races. Repeated use of the same unsealed area can also cause cumulative nutrient loading, odour, soft ground and vehicle rutting, making effective clean-up increasingly difficult. An impermeable surface with contained drainage allows spills and wash-water to be seen, recovered and returned to the waste-handling system rather than discharged to land unintentionally. Covered, leak-proof bins should remain the primary storage and transfer method, residence time should be minimised,

and the area should be inspected after each transfer. Open ground stockpiling should not be allowed because it would create an uncontrolled point source discharge point and make the actual loading and extent of contamination difficult to quantify.

Slopes. The site visit confirmed that the land is predominantly flat. The application maps land steeper than 15 percent (AEE Figure 2.16), and this is largely confined to the banks of Clear Creek and the Lauder Creek tributary, around the storage ponds and in the southwestern gully, much of which already falls within the Condition 6 setbacks. Slope is therefore a limited issue at this site, but the OMM is not sufficiently clear. The application states there will be no discharge to land steeper than 15 percent, but the OMM does not restate that limit or explain how slope will be confirmed on site. Slope affects both application control and contaminant transport. As slope increases, applied liquid and entrained solids have less opportunity to infiltrate before moving downslope, particularly where soils are wet, compacted, slowly permeable or recently cultivated. Vehicle travel and spreading on steeper ground can also create wheel tracks that concentrate flow, increase erosion and result in uneven application, with the potential for higher loading at the bottom of a slope. These risks are amplified where a slope drains towards a wetland, water race, depression or surface-water channel. Land exceeding 15 percent should therefore be shown on the application area maps and excluded through both a consent condition and the OMM, including within Blocks 15 and 16, where the OMM currently allows flexible application. The exclusion mapping should be site checked, and gentler land should also be excluded or subject to a wider buffer where local topography creates a direct or concentrated runoff pathway to any receiving environment, such as the CSAs and ephemeral flow paths observed during the site visit.

Possible Conditions Changes

Number	Conditions	Recommended change
1	2, 3, 11, 17 and 24	Require block-specific nutrient assessment based on dryland crop yields, verified loading data, a 300 kg N/ha per-application limit, a cumulative maximum of 600 kg N/ha over three years, and repeat application controls
2	6, 11 and 28	Map and protect wetlands, races, ephemeral and intermittent waterways, CSAs, runoff paths and slopes over 15 percent; apply the natural watercourse setback to race reaches that follow a natural watercourse; prohibit discharge in unsuitable soil or weather conditions.
3	2, 11 and 28	State winery wastewater limits, rainfall restrictions, trench safeguards and stop-discharge criteria directly in the consent.
4	8, 11 and 12	Require contained transfer areas, covered-bin storage, source-specific testing and justified stock and forage controls.
5	7, 11, 19, 23 and 26	Strengthen waste-characterisation, loading, soil and surface-water monitoring; require representative sampling locations and sufficient monitoring duration; and add defined investigation, notification, suspension, corrective-action and recommencement triggers.
6	11, 24 and 27	Require certification of substantive OMM changes and transfer critical safeguards into consent conditions.
7	28	Apply odour and dust outcome standards and stop-work, complaint and corrective-action requirements.



Keri Johnston
Natural Resources Engineer/Technical Director

Nicole Phillips
Principal Environmental Consultant

Limitations: The information presented in this report is based on observations and information available at the time of writing. While reasonable care has been taken in its preparation, Irricon Resource Solutions Limited cannot accept liability for inaccuracies arising from information supplied by third parties or from conditions that could not be verified during this review.

© Irricon Resource Solutions Limited 2026

Appendix 1 – Table of Facts Used to Inform the Assessment

Fact	Evidence used	Why it matters to the assessment
Nitrogen concentration in drainage increases substantially	Modelled average concentration increases from 7.1 to 44.8 mg N/L, approximately 6.3 times the baseline concentration.	The small change in total nitrogen loss does not mean the quality of drainage water remains similar. Both concentration and total loss need consideration.
The model predicts much less drainage	Average annual drainage reduces from 158 to 17 mm, approximately 89%.	The proposed system's results depend heavily on very low drainage. Changes in water management could materially alter those results.
Total modelled nitrogen loss increases only slightly	Annual loss increases from 1,941 to 2,005 kg N, an increase of 64 kg, or approximately 3%. The reported rounded averages are 8 and 9 kg N/ha/year.	This supports the applicant's statement about a small increase in total loss but must be read alongside the much higher drainage concentration and changed modelling assumptions.
The modelled nitrogen surplus increases	The reported surplus increases from 50 to 133 kg N/ha/year.	More nitrogen is modelled to enter the farm system than leaves in products and exported material.
Irrigation is removed from the proposed model	The baseline includes 187.3 ha of irrigation, including 169.8 ha of border-dyke irrigation. The proposed model includes none. At the site visit it was advised that irrigation will no longer be used on the property.	This is a major change between scenarios. The results cannot be assumed to represent operation with irrigation. The proposed model is consistent with the advice that irrigation will cease, but crop yield and nitrogen removal assumptions must then reflect dryland conditions.
The scenarios use different soil representations	Average modelled plant-available water storage increases from 25 to 79 mm at 60 cm depth. The areas assigned to different soil types also change. The site visit excavations near the current discharge area found a gravellier profile than expected.	The comparison changes soil assumptions as well as land management. These differences need explanation, particularly as a gravellier profile is likely to hold less water than the proposed model assumes.
The assumed oat yield is 10 tonnes of dry matter/ha	The model produces 576 tonnes from 57.6 ha, equivalent to 10 t dry matter/ha. No site harvest records have been supplied to verify this.	Nitrogen recovery depends on crop production. If this yield is unlikely under the site's dryland conditions, the assessment may overstate the crop's ability to recover nitrogen.

Nitrogen is applied in a large individual dose	Condition 3 allows 600 kg total N/ha per application. The OMM provides a three-year return period.	The average input of 200 kg N/ha/year does not describe the timing of the actual dose or when its nitrogen becomes available to plants.
A substantial nitrogen release is estimated in the first year	The applicant assumes 40% release, equivalent to 240 kg N/ha from a 600 kg N/ha application.	A growing crop needs sufficient capacity to use this nitrogen when it becomes available.
The operating plan allows treated land to remain bare	Catch crops are generally to be sown within one month, except during winter or peak summer dryness, when land may remain cultivated but unplanted.	The system expressly allows periods with little crop uptake. It therefore cannot rely on immediate crop recovery following every application.
Harvesting is not required throughout the rotation	In years 2–3, the OMM allows sheep grazing and/or silage production.	Grazing returns much of the nitrogen to the land through dung and urine. Crop uptake should not be treated as permanent removal unless harvested material is taken away.
The latest supplied WAS nitrogen result exceeds the original design assumption	The May 2026 sample contains 7.3% nitrogen on a dry-weight basis, compared with 6.6% used in the AEE's application calculations. The certificate does not report dry solids content.	At unchanged dry solids and delivered quantity, a dose calculated as 600 kg N/ha using 6.6% would contain approximately 664 kg N/ha using 7.3%. This illustrates the need to recalculate rates.
The first-year area limit constrains disposal capacity	WAS application is limited to 50 ha in the first 12 months. At the current limit of 600 kg N/ha, this accommodates 30 tonnes of nitrogen, below the 34.2-tonne annual site limit.	The site-wide limit does not guarantee that this amount can be applied. Available area and appropriate block loading can impose a lower practical limit.
The approximately 165 ha rotation also constrains capacity	The OMM identifies approximately 165 ha for the WAS rotation. At 600 kg N/ha, this accommodates 99 tonnes over three years, compared with the consent's site limit of 102.5 tonnes.	Usable area must be confirmed after exclusions and setbacks.
The site has a substantial seasonal moisture constraint	The AEE reports annual rainfall of approximately 510–545 mm for different historical periods. The proposed model uses annual potential evapotranspiration of approximately 941 mm.	Dry conditions constrain reliable crop establishment and yield. Low annual rainfall does not remove the possibility of runoff or drainage during individual wet periods.
Incorporation is required, but crop establishment is a separate step	WAS must be incorporated to at least 50 mm depth within 24 hours.	This reduces exposed sludge, odour and vector access. It does not itself establish a crop or demonstrate nitrogen recovery.

The application's slope exclusion is 15%, not 15 degrees	The AEE excludes slopes greater than 15%, approximately 8.5 degrees. A slope of 15 degrees is approximately 27%.	Confusing the units could substantially increase the steepness of land receiving waste. The OMM's flexible treatment of steeper blocks needs alignment with the application.
Setbacks differ between surface features	Condition 6 specifies 5 m from irrigation races, 50 m from other natural surface watercourses, and 20 m from ephemeral wetlands. The site visit confirmed the race is unbunded over large parts of the farm, where it follows a natural watercourse.	Race protection needs checking against spreader throw and runoff pathways. Race reaches that follow a natural watercourse warrant the natural watercourse setback. The wetland wording does not expressly cover all natural wetlands, and ephemeral and intermittent waterways and CSAs are not specifically addressed.
The site is predominantly flat, with ephemeral and intermittent waterways and CSAs	Site visit, 16 October 2026. Land steeper than 15% is mainly along creek margins, around storage ponds and in the southwestern gully (AEE Figure 2.16). Ephemeral and intermittent waterways and CSAs are not identified in the application, OMM or Environmental and Nutrient Management Plan.	Slope-related risk is limited. However, flat ground is prone to ponding, and these features can concentrate runoff during wet periods. They need to be mapped and either excluded or buffered.
The certified OMM already extends surface water monitoring	Condition 19 requires a first-year programme; OMM Table 8.2 provides quarterly surface water monitoring for five years.	Five-year monitoring is an existing commitment. The remaining issues include securing its continuation and defining investigation and corrective-action requirements.
Winery application limits are recorded in the application	The AEE commits to 24 mm per application, 170 kg N/ha/year, and no application within 48 hours after rain.	Daily volume limits alone do not prevent excessive loading of a small area. These local application limits should be clearly reflected in operating procedures and conditions.

Appendix 2 – Site Visit Record (16/10/2026)

Site visit undertaken with Nicole (e3 Scientific), Dwayne, Chris, and Shannon (ORC).

Discharge was not occurring due to rainfall earlier in the week resulting in unsuitable spreading conditions.

Site is predominantly flat. There are a number of ephemeral/intermittent waterways and Critical Source Areas (CSAs) on the farm.

Sighted the spring that is of concern opposite the down-gradient boundary.

Sighted the main yard and spreading and discing equipment used.

Current discharge area is in the NW/N part of the farm. Saw an area of recently planted oats.

Irrigation race is not bunded for large parts of the farm (it uses a natural water course).

No plans to use irrigation at all any more on the property.

Plans to install a third monitoring bore near the oat crop (pin on Figure 1 below).

Two excavations sighted – soil profile is gravellier than expected. Sites did not have any groundwater (depth of excavations approx. 3 m).



Figure 1: Location Plan



Photo 1: looking towards spring (willows) – permitted water take



Photo 2: monitoring bore on down-gradient boundary opposite permitted water take



Photo 3: soil profile near to current discharge area



Photo 4: oat crop in current discharge area