

APPENDIX C

PRELIMINARY ADVICE FOR ON-SITE EFFLUENT DISPOSAL





Land Capability Services

Preliminary Advice
for
On-site Effluent Disposal

1207 Winery Cellar Door
Lot 229 DP754868
1207 Nanima Road
Nanima NSW 2582

November 2021

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INTRODUCTION

This report provides preliminary advice for on-site effluent disposal at the applicant's proposed cellar door development. Later developments may include an experience centre and commercial kitchen. Waste streams from the winery mainly from bottle washing should also be considered.

Site constraints include shallow clay soils, slopes of between 6-10 degrees and proximity to dams, drainage lines, a permanent creek and groundwater bore. The site lies within an area of groundwater vulnerability.

Wastewater streams will require secondary treatment, or possibly tertiary depending on the method of application to the receiving soil and health considerations around tourism and labour operations within the vineyard.

The land most suitable for effluent application (sufficient depth of soil, gentle/moderate slopes) is that which is also largely occupied by grape vines, and it is recommended that options for recycling wastewater for reuse on vine crops are explored.

SITE CHARACTERISTICS

The terrain of the site comprises moderately inclined mid slopes of 6-10 degrees overlying Ordovician metasediments of the Pittman Formation. The slope across the proposed irrigation areas within the vineyard have linear divergent configuration ensuring that runoff does not concentrate within the site. Incised drainage lines divide the vineyard and may impose setbacks to the areas of effluent application. The soil at the site is an imperfectly drained Kurosol within the Macanally Mountain soil landscape. It comprises loam to clay loam topsoil horizons to 10cm and 32cm respectively, overlying a light-medium clay subsoil horizon to 65cm. Weathered sedimentary rock underlies the soil profile.



SITE EVALUATOR

Company Name Land Capability Services
ph: 0417 694 638
email: rgmiller@me.com
Date of assessment October 19, 2021

Signature of evaluator



SITE INFORMATION

Address Lot 229 DP754868, 1207 Nanima Road
Nanima NSW 2582
Council area Yass Valley
Owner/developer Brett & Leonie Waldock
Area: 33ha
Site plan attached Yes
Photograph attached Yes
Intended water supply Rainwater
Initial wastewater quantity (litres/day) 1375
cellar door x 50 patrons (Dishwasher Allowance 775L/day + 50 patrons @ 12L/day = 1375 litres/day)



SITE ASSESSMENT

Climate Warm to hot summers with a large evaporative deficit. Cool to cold winters with a small evaporative deficit

Where appropriate:

| | |
|--|-----|
| Rainfall water balance attached | Yes |
| Land application area calculation attached | Yes |
| Wet weather storage area calculation attached | NA |

Flood potential:

| | |
|--|-----|
| Land application area above 1 in 20 year flood level | Yes |
| Land application area above 1 in 100 year flood level | Yes |
| Electrical components above 1 in 100 year flood level | Yes |

| | |
|--------------------------|---|
| Exposure | Well exposed with partial shade. |
| Slope | Linear divergent |
| Landform | Mid slope |
| Run-on | Moderate, cellar door development may require stormwater diversion measures |
| Seepage | None in irrigation area |
| Erosion Potential | High if overgrazed, area to be fenced off from stock |
| Site Drainage | Imperfectly drained |
| Fill | None in application area |

Groundwater:

| | |
|---|--------------------------------|
| Horizontal distance to groundwater well used for domestic water supply | >100m |
| Groundwater vulnerability map referred to | Yass LEP 2013 Sheet CL2_005 |
| Vulnerability rating | Within vulnerability area |
| Bores in the area and their purpose | Stock & domestic |

Buffer distance from wastewater management system to:

| | |
|-----------------------------|-------|
| Coots Creek | >100m |
| Dams | >40m |
| Drainage lines | >40m |
| Boundary of property | >6m |
| Driveways | >3m |
| Buildings | >15m |

Is there sufficient land area for:

| | |
|--|-----|
| Application system (including buffer distances) | Yes |
| Reserve application system (including buffer distances) | Yes |

Surface rocks Outcropping upslope of effluent application area

SOIL ASSESSMENT

| | |
|--|--|
| Depth to bedrock or hardpan | 65cm |
| Depth to soil water table | >65cm |
| Hydraulic loading rate | |
| Soil structure | Weak to moderately structured topsoil Moderately structured subsoil |
| Soil texture | Loam to clay loam topsoil Light-medium clay subsoil |
| Permeability category | (4) 0.5-1.5m/day in topsoil (6) <0.06m /day in subsoil |
| Coarse Fragments | 5% to 10mm in topsoil 20% to 20mm subsoil |
| Bulk Density | Estimate 1.5 in topsoil Estimate 1.3 in subsoil |
| Ph (1:5 Water) | Topsoil 5.6 Subsoil 7.0 |
| Electrical conductivity (dS/m) | Topsoil .04 Subsoil .09 |
| Geology & soil landscape survey | |
| Presence of discontinuities | None |
| Presence of fractured rock | Extent unknown |
| Soil landscape reference | Macanally Mountain |
| Dispersiveness | None in topsoil EAT 8 Present in remoulded subsoil EAT 3 |

SYSTEM SELECTION

Consideration of connection to a centralised sewerage system

| | |
|---|------|
| Nearest feasible connection point | >5km |
| Potential for future connection to centralised sewerage | None |
| Potential for future connection to reticulated water | None |

Type of land application system to be explored:

Surface drip irrigation.

| | |
|---------------|--|
| Reason | Suits site and soil characteristics, shallow medium clay subsoil unsuited to subsoil dispersal of effluent in trenches or beds. Slopes generally too steep for surface sprinklers. Utilises existing drip irrigation infrastructure. |
|---------------|--|

Type of treatment system to be explored:

Aerated wastewater treatment system or similar system capable of secondary or tertiary level of treatment

| | |
|---------------|--|
| Reason | Superior standard of treatment for site and soil conditions. |
|---------------|--|

GENERAL COMMENTS

Are there any specific environmental constraints?

Within area of groundwater vulnerability
Permanent creek requires 100m buffer distance from effluent management area
Groundwater bore also 100m setback
Drainage lines 40m setback
Slopes greater than 6 degrees too steep for surface sprinklers – drip irrigation under mulch would be an alternative
Shallow rocky soils restrict effluent application to comparatively deeper soils within the vineyard.

Are there any specific health constraints?

Adequately treated wastewater should eliminate or reduce pathogens to the point where human exposure is unlikely or at levels unlikely to cause infection. However it should be remembered that breakdowns in wastewater treatment or irrigation systems from component failure/power supply interruption/neglected maintenance may result in insufficiently treated wastewater or effluent plumes that may cause infection in members of the public or vineyard workers. Protocols to avoid cross contamination of drinking water supplies will be necessary.

TOPICS FOR FURTHER RESEARCH

Integration of wastewater streams into vineyard irrigation

Analysis of wastewater from bottle-washing operations to assess suitability for direct application to the irrigation system. It may be possible to bypass treatment facilities as a greywater stream, reducing the load on the secondary/tertiary treatment system. Greywater streams are typically applied directly to effluent management areas as storage is usually not recommended due to the potential for the greywater to rapidly turn septic.

Integration of wastewater streams into vineyard irrigation systems will need to account for dose load sizes and frequency which may inform irrigation zone division and areas. Irrigation budgeting will inform the degree of supplementation with the existing bore water supply. Nutrient budgeting, especially for N and P will need to be considered. Manual vs auto sequencing valves, and irrigation filter systems and maintenance to be considered.

Treatment system design


Future commercial kitchen and experience centre - increases to wastewater load. Design capacity into initial system or add stages/modules later.


Grease trap for commercial kitchen

Commercial kitchen wastewater streams incorporating commercial dishwashers and/or self-cleaning ovens – effects of cleaning agents on concrete tanks and components

Fig 1. Area suitable for wastewater application



Photo point 

Slope direction 

Drainage line 

APPENDIX 1: SOIL SURVEY SHEET

Soil Survey Sheet

ics
Land Capability Services

Date: 25.10.21
 Site Address: 1207 Nunn Road, Nunn
 Client: Vasek, Vasek 1207

| Depth | Boundary | Texture | Structure | Colour | Mottles | Coarse Frag | Consistence | Plasticity |
|----------------|----------|---------------------|-----------|------------------------|---------|-------------|----------------------|------------|
| A ₁ | | Loam | Weak | Dark Yellowish Brown | - | 5% to 10% | Slightly moist loose | Moist |
| A ₂ | | Clay loam | Medium | Medium Yellowish Brown | - | 10% to 15% | Slightly moist weak | Moist |
| B ₁ | | Light / Med. Clay | Medium | Brownish Dark | - | 20% to 25% | Slightly moist weak | Moist |
| C | 650 + | Unconsolidated Rock | | | | | | |

