

# ONSITE WASTEWATER DISPOSAL FEASIBILITY STUDY

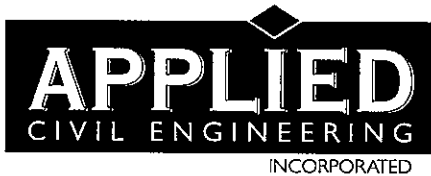
FOR

## MANSFIELD WINERY

LOCATED AT:  
Conn Valley Road  
St. Helena, CA 94574  
NAPA COUNTY APN 025-180-017

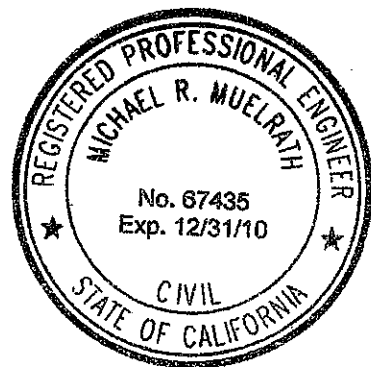
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## INTRODUCTION

Richard and Leslie Mansfield are applying for a Use Permit to construct and operate a new winery at their property located off of Conn Valley Road, in Napa County, California. The subject property is located along the north side of Conn Valley Road, approximately one mile east of the intersection of Conn Valley Road and Rossi Road. The subject parcel is also known as Napa County Assessor's Parcel Number (NCAPN) 025-180-017.

There is currently a stone building and wooden barn structure on the subject parcel. Other existing improvements include a septic system that serves an existing residence located at 1291 Conn Valley Road (directly across Conn Valley Road), a well, two driveways and the associated utility and infrastructure improvements typical of the existing uses. The use permit application under consideration proposes the renovation of the existing stone and wood structures to house a winery with the following characteristics:

- Wine Production:
  - 20,000 gallons of wine per year
  - Full wine production including:
    - Crushing
    - Fermenting
    - Aging
    - Bottling
- Employees:
  - Two (2) full-time employees
  - One (1) part-time employee
- Marketing Plan:
  - Daily Tours and Tastings by Appointment
    - 20 visitors per day maximum
  - Private Food and Wine Events for Trade
    - 5 per year
    - 36 guests maximum
    - Food prepared offsite
  - Private Winemaker's Dinners
    - 12 per year
    - 12 people maximum
    - Food prepared onsite
  - Wine Auction & Release Party Events
    - 2 per year
    - 150 guests maximum
    - Portable sanitary facilities

Richard and Leslie Mansfield have requested that Applied Civil Engineering Incorporated (ACE) evaluate the feasibility of disposing of the winery process wastewater and the domestic sanitary wastewater that will be generated by the proposed winery via an onsite wastewater disposal system.

The existing septic tank / seepage pit located on the subject parcel that serves the residence located at 1291 Conn Valley Road will be relocated onto the 1291 Conn Valley Road parcel prior to implementation of the winery project and thus is not addressed in this study.

The remainder of this report describes the onsite soil conditions, the predicted process and sanitary wastewater flows and outlines the conceptual design of an onsite wastewater disposal system to serve the proposed winery.

## **SOILS INFORMATION**

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County shows the northern one third of the parcel mapped as Bale clay loam, 0 to 2 percent slopes and the southern two thirds of the parcel, bordering Conn Valley Road is mapped as Forward gravelly loam, 9 to 30 percent slopes.

A site specific soils analysis was conducted during a site evaluation performed by Applied Civil Engineering Incorporated on October 17, 2008. The site evaluation consisted of the excavation and observation of ten test pits throughout the approximately two acre parcel. During the site evaluation we discovered variable soil conditions. Test Pits 1 through 7 generally consisted of a loamy sand material with a granular structure deposited over sandy clay loam soil with a weak to moderate subangular blocky structure. Acceptable soil depths in these test pits ranged from 12 inches to 60 inches. Test Pits 8 through 10 consisted of denser sandy clay and clay loam materials with angular blocky to subangular blocky structure and acceptable depths of 36 inches to 60 inches. Our analysis of soil texture was based on field methods and laboratory testing was not performed. Perched groundwater was not observed in any of the ten test pits at the time of excavation or within the following two hours. Please refer to the Site Evaluation Report in Appendix 3 for further soil information.

## **PREDICTED WASTEWATER FLOW**

### **Winery Process Wastewater**

We have used the generally accepted standard that six gallons of winery process wastewater are generated for each gallon of wine that is produced each year and that 1.5 gallons of wastewater are generated during the crush period for each gallon of wine that is produced. Based on the size of the winery and the expectation that both white and red wine will be produced at the winery, we have assumed a 45 day crush period. Using these assumptions, the annual, average daily and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{20,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

$$\text{Annual Winery Process Wastewater Flow} = 120,000 \text{ gallons per year}$$

$$\text{Average Daily Process Wastewater Flow} = \frac{120,000 \text{ gallons wastewater}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

$$\text{Average Daily Winery Process Wastewater Flow} = 329 \text{ gallons per day}$$

$$\text{Peak Winery Process Wastewater Flow} = \frac{20,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{45 \text{ crush days}}$$

$$\text{Peak Winery Process Wastewater Flow} = 667 \text{ gallons per day (gpd)}$$

### **Winery Sanitary Wastewater**

The peak sanitary wastewater flow from the winery is calculated based on the number of winery employees, the number of daily visitors for tours and tastings and the number of guests attending marketing events. In accordance with Table 4 of the Napa County Environmental Management Department "Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems" we have used a design flow rate of 15 gallons per day per employee and 3 gallons per day per visitor for tours and tastings. Table 4 does not specifically address design wastewater flows for guests at marketing events. Since the applicant is proposing that meals for marketing events with up to 12 guests will be prepared onsite and all meals for marketing events with more than 12 guests will be prepared offsite, we have estimated 15 gallons per guest at marketing events where meals will be prepared onsite and 5 gallons of wastewater per guest at marketing events where meals will be prepared offsite. Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

#### Employees

$$\text{Peak Sanitary Wastewater Flow} = 3 \text{ employees} \times 15 \text{ gpd per employee}$$

$$\text{Peak Sanitary Wastewater Flow} = 45 \text{ gpd}$$

#### Daily Tours and Tastings

$$\text{Peak Sanitary Wastewater Flow} = 20 \text{ visitors per day} \times 3 \text{ gallons per visitor}$$

$$\text{Peak Sanitary Wastewater Flow} = 60 \text{ gpd}$$

#### Private Food and Wine Events for Trade

$$\text{Peak Sanitary Wastewater Flow} = 36 \text{ guests} \times 5 \text{ gallons per guest}$$

$$\text{Peak Sanitary Wastewater Flow} = 180 \text{ gpd}$$

#### Private Winemaker's Dinners

$$\text{Peak Sanitary Wastewater Flow} = 12 \text{ guests} \times 15 \text{ gallons per guest}$$

$$\text{Peak Sanitary Wastewater Flow} = 180 \text{ gpd}$$

### Total Peak Winery Sanitary Wastewater Flow

Assuming that daily tours and tastings, private food and wine events for trade and winemaker's dinners will not be scheduled to occur on the same day and that all events with more than 36 guests will utilize portable sanitary facilities, the total peak winery sanitary wastewater flow is calculated as follows:

Total Peak Winery Sanitary Wastewater Flow = 45 gpd + 180 gpd

Total Peak Winery Sanitary Wastewater Flow = 225 gpd

### **Combined Peak Wastewater Flow**

Combined Peak Wastewater Flow = Peak Winery Process Wastewater Flow + Total Peak Winery Sanitary Wastewater Flow

Combined Peak Flow = 667 gpd + 225 gpd

Combined Peak Flow = 892 gpd

### **RECOMMENDATIONS**

Given the soil conditions encountered during the site evaluation, the proposed site plan layout and the design wastewater flows calculated above, we recommend that the area in the vicinity of Test Pits #1, #2 & #3 be used for wastewater disposal. We have identified two possible scenarios for disposing of the process and sanitary wastewater generated at the subject parcel:

Option #1 – Combined Sanitary and Process Wastewater Disposal Field

Option #2 - Sanitary Wastewater Disposal Field and Process Wastewater Hold and Haul

The decision about which type of wastewater disposal system to implement will be made by the property owner and the engineer at the time of building permit submittal.

The following sections of this report outline the conceptual design of the wastewater disposal systems for both of these options.

#### **Option #1 – Combined Sanitary and Process Wastewater Disposal Field**

In this scenario all sanitary and process wastewater would be treated and disposed of onsite in a subsurface drip type septic system.

#### Required Disposal Field Area

The soil encountered in the proposed disposal field area consists of granular loamy sand overlying a sandy clay loam with a weak to moderate subangular blocky structure. We recommend a soil application rate of 0.4 gallons per square foot per day. The required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{892 \text{ gpd}}{0.4 \text{ gpd per square foot}}$$

*Required Disposal Field Area = 2,230 square feet*

#### Available Disposal Field Area

Based on the topographic map prepared by Michael W. Brooks and Associates, ACE has determined that there is enough area to install the required 2,230 square feet of subsurface drip disposal field in the vicinity of Test Pits #1, #2 and #3. The conceptual layout of the disposal field is shown on the Mansfield Winery Use Permit Conceptual Site Plan prepared by ACE which is included in Appendix 2 of this document.

#### 200% Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that the primary system fails. For subsurface drip disposal fields, the reserve area must be two times the area of the primary area. Based on the topographic map prepared by Michael W. Brooks and Associates, ACE has determined that there is enough area to set aside for an additional 4,460 square feet of subsurface drip disposal field in the vicinity of Test Pits #1, #2 and #3.

#### Septic Tank Capacity

The process and sanitary wastewater from the winery buildings should be collected in septic tanks and must be treated to Napa County Environmental Management Department Pretreated Effluent requirements ( $\text{BOD}_5 < 30 \text{ mg/l}$  and  $\text{TSS} < 30 \text{ mg/l}$ ) prior to delivery to the disposal field.

We recommend that at least two 1,500 gallon septic tanks be installed to provide a minimum of three to five days hydraulic retention time for peak winery process wastewater flows. Furthermore, for ease of operation and maintenance, we recommend that the sanitary wastewater flows from the winery building be kept separate from the process wastewater flows and be directed to a separate 1,500 gallon septic tank. A dedicated grease interceptor tank should be designed to process all waste from the proposed kitchen plumbing fixtures prior to it reaching the sanitary wastewater septic tank. Effluent from the winery process wastewater septic tanks and effluent from the winery sanitary wastewater septic tank should join in a common vessel from which it will be dosed to the treatment system. Depending on the type of treatment system selected, additional septic tanks may be required. Furthermore, a sump tank and pumping system will be required to deliver effluent from the treatment system to the disposal field.



## **Option #2 – Sanitary Wastewater Subsurface Drip Disposal and Process Wastewater Hold and Haul**

In this scenario the sanitary wastewater would be disposed of in a subsurface drip disposal field and process wastewater would be temporarily stored and then would be hauled offsite for treatment and disposal by the Napa Sanitation District, East Bay Municipal Utility District or a similar municipal wastewater treatment plant.

### Required Disposal Field Area

Sanitary wastewater disposal is the same as that described in Option #1 above. The required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{225 \text{ gpd}}{0.4 \text{ gpd per square foot}}$$

$$\text{Required Disposal Field Area} = 563 \text{ square feet}$$

### Available Disposal Field Area

Based on the topographic map prepared by Michael W. Brooks and Associates, ACE has determined that there is enough area to install the required 563 square feet of subsurface drip disposal field in the vicinity of Test Pits #1, #2 and #3. The conceptual layout of the disposal field is shown on the Mansfield Winery Use Permit Conceptual Site Plan prepared by ACE which is included in Appendix 2 of this document.

### 200% Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that the primary system fails. For subsurface drip disposal fields, the reserve area must be two times the area of the primary area. Based on the topographic map prepared by Michael W. Brooks and Associates, ACE has determined that there is enough area to set aside for an additional 1,126 square feet of subsurface drip disposal field in the vicinity of Test Pits #1, #2 and #3.

### Septic Tank Capacity

Sanitary wastewater septic tank capacity and pretreatment requirements are similar to Option #1 described above.

### Winery Process Wastewater Disposal

The winery process wastewater hold and haul system must be designed to hold at least seven days of peak flow (4,669 gallons), have a water level alarm and be designed and constructed in accordance with the requirements outlined in the Napa County Environmental Management Department Hold and Haul for Winery Process Wastewater Management information sheet.

## **CONCLUSION**

It is our opinion that the wastewater from the proposed winery can be accommodated in either of the two options previously described. Full design calculations and construction plans for the wastewater system(s) should be prepared in accordance with Napa County Environmental Management Department standards at the time of building permit application.