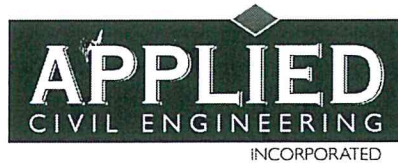


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Revised Wastewater Analysis



April 14, 2017
May 18, 2017 (Revision #1)

Job No. 08-109

Kim Withrow, REHS
Environmental Health Division
Napa County Planning, Building and Environmental Services Department
1195 Third Street, Suite 210
Napa, CA 94559

Re: Onsite Wastewater Disposal Feasibility Study for the
Materra Winery Use Permit Modification
4326 Big Ranch Road, Napa County, California APN 036-160-003
P08-00428-UP & P15-00071-MOD

Dear Ms. Withrow:

At the request of Materra Winery we have evaluated the process and sanitary wastewater flows associated with the proposed Use Permit Modification. We have also analyzed the capacity of the existing process and sanitary wastewater system serving the winery facility to determine if it is adequate to serve the proposed changes in use.

It is our understanding that Materra Winery was originally permitted produce 50,000 gallons of wine per year (P08-00428). Production capacity was increased to 85,000 gallons of wine per year by Major Mod P15-00071. The current proposal is to increase production to a maximum of 110,000 gallons per year. Furthermore, we understand that the proposed Use Permit Modification will not change the number of employees, visitors or marketing events which were previously permitted under P08-00428 and are summarized below:

- Employees:
 - Three (3) full-time employees
 - Three (3) part-time employees
 - Four (4) seasonal employees

- Marketing Plan:
 - Daily Tours and Tastings by Appointment
 - 18 visitors per day maximum
 - Private Food and Wine Events
 - 12 per year
 - 25 guests maximum
 - Private Food and Wine Events
 - 12 per year
 - 50 guest maximum
 - Harvest Events
 - 2 per year
 - 100 guests maximum
 - Portable toilets will be utilized

The remainder of this letter describes the existing process and sanitary wastewater system, its design capacity, peak flows associated with the proposed changes in use and our analysis and recommendations related to the system's capability to handle the anticipated wastewater flows

Existing Septic System

The existing process and sanitary wastewater disposal system consists of a standard gravity distribution leach field with a total of 4,200 lineal feet of trench with infiltrator chambers. The distribution boxes and leach line trenches were installed by M.C. Dixon, Inc. in the Fall of 2010, prior to the winery being constructed.

The design flow for the leach field is 3,111 gallons per day (gpd) and consisted of winery process and sanitary wastewater flows as well as a planned future residence as outlined in the Winery Septic System Design Calculations for Materra prepared by ACE dated October 14, 2010. The leach field is located immediately east of the winery building.

There are also several sanitary sewer and process wastewater septic tanks that were installed as part of the winery construction project that was administered by Ledcor Construction. The location of the existing septic tanks is shown on the Materra Winery Wastewater System Plan prepared by Lescure Engineers, Inc. (attached).

Proposed Process Wastewater Design Flows

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 proposed 110,000 gallon production capacity and the expectation that both white and red wine will be produced at the winery, we have assumed a 60 day crush period. Using these assumptions, the annual, average daily and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{110,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

Annual Winery Process Wastewater Flow = 660,000 gallons per year

$$\text{Average Daily Process Wastewater Flow} = \frac{660,000 \text{ gallons wastewater}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

Average Daily Winery Process Wastewater Flow = 1,808 gallons per day

$$\text{Peak Winery Process Wastewater Flow} = \frac{110,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{60 \text{ crush days}}$$

Peak Winery Process Wastewater Flow = 2,750 gallons per day (gpd)

Proposed Sanitary Wastewater Design Flows

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 the food and wine pairing 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 the 25 or 50 person food and wine pairing events. Since the applicant is proposing that food service may either be catered or prepared onsite, we have conservatively estimated 15 gallons of wastewater per guest at these events assuming that wastewater generation will be similar to that of a conventional restaurant. Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

Employees

Peak Sanitary Wastewater Flow = 10 employees X 15 gpd per employee
 Peak Sanitary Wastewater Flow = 150 gpd

Daily Tours and Tastings

Peak Sanitary Wastewater Flow = 18 visitors per day X 3 gallons per visitor
 Peak Sanitary Wastewater Flow = 54 gpd

Private Food and Wine Events (12 per year)

Peak Sanitary Wastewater Flow = 25 guests X 15 gallons per guest
 Peak Sanitary Wastewater Flow = 375 gpd

Private Food and Wine Events (12 per year)

Peak Sanitary Wastewater Flow = 50 guests X 15 gallons per guest

Peak Sanitary Wastewater Flow = 750 gpd

Harvest Events (2 per year)

Not included because portable toilets are used.

Total Peak Winery Sanitary Wastewater Flow

Assuming that daily tours and tastings and food and wine pairing events may occur on the same day and that portable toilets will be used for all events with more than 50 guests in attendance, the total peak winery sanitary wastewater flow is calculated as follows:

Total Peak Winery Sanitary Wastewater Flow = 150 gpd + 54 gpd + 750 gpd

Total Peak Winery Sanitary Wastewater Flow = 954 gpd

Combined Peak Winery Wastewater Flow

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

Combined Peak Winery Wastewater Flow = 2,750 gpd + 954 gpd

Combined Peak Winery Wastewater Flow = 3,704 gpd

Residential Wastewater Flow

It was previously planned that a future new residence would be connected to the winery septic system. However, a new area to the west of the winery has been identified for a residential septic system and the residence will no longer be connected to the winery septic system. Plans for this new residential septic system have been reviewed and approved by Napa County (E15-00734 & E15-00735).

Proposed Design Flow vs Existing Capacity

The predicted Combined Peak Winery Wastewater Flow for the above described operational characteristics (3,704 gpd) is slightly more than the design capacity of the existing wastewater disposal field (3,111 gpd).

Recommendations

The winery holds most of the 25 and 50 person food and wine pairing events outside of the peak harvest season. In order to keep the predicted wastewater flows within the capacity of the existing septic system we suggest that this practice continue and no 25 or 50 person food and wine pairing events be scheduled during the harvest period when process wastewater flows are at their highest levels. Tours and tastings by appointment would continue at the permitted level. This would reduce the Peak Winery Sanitary wastewater flow to 204 gpd and thus the Combined Peak Winery Wastewater Flow would be reduced to 2,954 gpd which is well under the design capacity of 3,111 gpd.

Wastewater Disposal Field

Provided that the approval of this Use Permit Modification is conditioned to ensure that the 25 and 50 person food and wine pairing events are not scheduled during harvest, no modifications to the wastewater disposal field are required.

Septic Tanks

The total required septic tank capacity based on a minimum hydraulic retention time for peak flows of three days is 2,862 gallons for sanitary waste and 8,250 gallons for process waste. The existing sanitary waste septic tanks provide a total of 4,500 gallons of tank capacity and thus are adequate. The existing process waste septic tanks provide a total volume of 5,000 gallons and thus additional volume will be required. This additional process waste septic tank capacity can be accommodated by installing one new 4,000 gallon (minimum) septic tank in series with the existing process waste septic tanks located just east of the winery building.

Reserve Area

The 100% reserve area will be located west of the winery building as originally designed. Since the design flow is within the original design capacity of the septic system no change in the reserve area is required.

Summary

The calculations presented above illustrate that the wastewater flows associated with the proposed Use Permit Modification can be accommodated provided that the approval is conditioned to ensure that the 25 and 50 person food and wine pairing events are not scheduled during harvest and that one additional 4,000 gallon process wastewater septic tank is installed in series with the existing process wastewater septic tanks. No modifications to the disposal field are required.

Full design specifications for the required septic system improvements must be prepared for County review and permitting after the subject Use Permit Modification is approved and before any work to modify the septic system is started.

We trust that this provides the information you need to process the subject Use Permit Modification. Please feel free to contact us at (707) 320-4968 if you have any questions.

Sincerely,

Applied Civil Engineering Incorporated

By:

Michael R. Muelrath

Michael R. Muelrath RCE 67435
Principal



Copy:

Brian Cunat, Materra Winery (via email)
Beth Painter, Balanced Planning (via email)

