

GOSECROSS CELLARS

Yountville, Napa County, California

WASTEWATER MANAGEMENT SYSTEM FEASIBILITY STUDY

WINERY PROCESS WASTEWATER

Characteristics -- Typical winery process wastewaters: bottling, tank, barrel, equipment and floor cleaning. Crushing occurs at the facility. No distillation will occur at the facility; hence there will be no stillage waste.

Collection and Transport -- Process wastewater (PW) is screened and collected at floor and trench drains within the winery and at exterior crush, receiving and tank areas. PW is transported from the winery by gravity to a PW settling tank. PW then flows through an effluent filter prior to discharge into the wastewater pump sump where it is finally pumped to the combined pressure distribution leachfield.

Treatment -- The settling/septic tank and pressure distribution (PD) method of handling winery wastewater is an accepted and appropriate method for wineries of this size range given appropriate soils. Numerous systems of this type exist in Napa County and are permitted by the Napa County Department of Environmental Management (NCEM) or the Regional Water Quality Control Board.

Design Flows

The winery currently generates wastewater estimated at 3 gallons of process wastewater per gallon of wine. This is based on the various production rates for full production (crush, ferment, barrel and bottle), partial production (crush, ferment, bottle), and onsite bottling. All three types of production are currently being completed at Goosecross Cellars with an estimated 3 gallons of PW generated per gallon on wine produced. Based on characteristics and corresponding process wastewater (PW) generation rates from the existing production, projected flows are calculated as follows:

Annual Volume

Annual production (projected)	=	40,000 gal/year
Wine generation rate (assumed)	=	165 gal wine/ton
	=	242 tons/year
PW generation rate (assumed)	=	3.0 gal PW/gal wine (Existing PW generation)
PW flow	=	40,000 gal wine x 3.0 gal PW/gal wine
	=	<u>120,000 gal PW/year</u>

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Average Day Flow

$$120,000 \text{ gal PW}/365 \text{ days} = \underline{329 \text{ gal PW/day}}$$

Peak Week Harvest Day Flow

The peak week harvest flow is based on the tonnage of grapes crushed. The maximum tonnage per week is estimated to be 70 tons.

$$\begin{aligned} \text{Peak Week Harvest Day} &= \frac{70 \text{ tons} \times 165 \text{ gallons wine/ ton} \times .90 \text{ gal PW/ gal wine}}{7 \text{ days / week}} \\ &= 1485 \text{ gal/day} \end{aligned}$$

Per Napa County NCEM

$$\begin{aligned} \text{Average Harvest Flow} &= \frac{\text{Annual Wine Production (Gallons)} \times 1.5}{\text{No. of days of crush (not to exceed 60 days)}} \\ &= \frac{40,000 \text{ gal wine/ year} \times 1.5}{45 \text{ days}} \\ &= 1,333 \text{ gal/day} \end{aligned}$$

The peak harvest flow of 1,485 gal/day will be utilized for the design of the leachfield.

Process Wastewater Settling Tanks

The required settling tank size for the winery PW flow per criteria from NCEM is calculated as a minimum detention time of 3 days, resulting in:

$$1,485 \text{ gal/day} \times 3 \text{ day} = 4,455 \text{ gal}$$

Goosecross Cellars will utilize three 1,500 gallon process wastewater settling tank to handle the PW flow. An effluent filter will be installed at the outlet of the settling tanks to reduce solids passage to the pump station and PD system leachfield.

SANITARY WASTEWATER (SW)

Sanitary wastewater (SW) at Goosecross Cellars will consist of typical wastewater generated from restrooms, laboratory, and kitchen/lunch room facilities. Anticipated sanitary wastewater flows are projected as follows:

Average Day

Full-time employees	6 @ 15 gpd	=	90 gpd
Part time employees	2 @ 15 gpd	=	30 gpd
Visitors	40 @ 2.5 gpd	=	100 gpd
Business Visitors	1 @ 2.5 gpd	=	2.5 gpd
			222.5 gpd

Peak Day (Harvest)

Full-time employees	8 @ 15 gpd	=	120 gpd
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Part time employees	2 @ 15 gpd	=	30 gpd
Visitors	100 @ 2.5 gpd	=	250 gpd
Business Visitors	4 @ 2.5 gpd	=	<u>10 gpd</u>
			410 gpd

Average Day with Event

Full-time employees	6 @ 15 gpd	=	90 gpd
Part time employees	2 @ 15 gpd	=	30 gpd
Visitors	40 @ 2.5 gpd	=	100 gpd
Event	50 @ 2.5 gpd	=	125 gpd
Business Visitors	1 @ 2.5 gpd	=	<u>2.5 gpd</u>
			347.5 gpd

The existing leachfield for the winery has an approximate capacity of 375 gal/day with 500 feet of leachline installed. Currently this leachfield provides disposal for the winery and restroom. The client will abandon the existing leachfield and combine the peak day flow of 410 gpd with the PW prior to discharging to the new leachfield.

Sanitary Wastewater Septic Tanks

The required septic tank size for the winery SW flow based on NCEM criteria is calculated from Table 13.44.020:

Flow, gal/d	Recommended Minimum Capacity, gal
600	1,200
900	1,500
1,200	2,000
1,500	2,500

One new 1,200 gallon septic tank (or utilization of the existing tanks) would be adequate to handle the SW flow. An effluent filter should be added to the outlet of the septic tank to reduce solids passage to the leachfield.

Combined PW and SW Leachfield

On May 2, 2001 Wendy Ziegler and Brad Holstien of Summit Engineering, Inc. conducted a site evaluation with Sheldon Spoznik and Soni Shultze, representatives from the Napa County Environmental Management (NCEM) Department. Five test holes (SP-1 thru SP-5) were dug to a depth of 84 inches. Test pits SP-2 and SP-5 were found to be unsuitable for a process wastewater (PW) pressure distribution system (PD) system. Test pits SP-1, SP-3 and SP-4 had acceptable soils to 60-inches which would allow for a PD system with a 24-inch deep trench. The approximate location of the test pits is shown on the attached wastewater drawing.

Acceptable soil for a PD system was found in the proposed leachfield area for the winery to a depth of 60 inches with a percolation rate of 1-3 in/hr. An assumed percolation rate of 2 inches/hour (30 mpi) will be used for the preliminary sizing of this leachfield. The corresponding application rate for a pressure distribution system is 0.56 gal/sf/day. A pressure distribution (PD) leachfield system is proposed with 24-inch deep trenches, 12 inches of gravel below the pipe, and a trench sidewall area of 2.0 square feet/lineal feet (sf/lf).

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Required leachfield size is calculated as follows:

$$\begin{aligned} \text{Leachline} &= \frac{1,485 \text{ gpd} + 410 \text{ gpd}}{2.0 \text{ sf/lf} (.56 \text{ gal/sf/day})} \\ &= 1692 \text{ lf} \end{aligned}$$

A PD leachfield system with 1,692 lf of leachline should be adequate to handle the peak combined wastewater flow of 1,895 gpd. Per NCEM department requirements, 100% reserve area must be designated for the leachfield. The total leachfield and reserve area will require an area of 20,000 square feet. (Approximately 200 feet x 100 feet) Only the primary leachfield of 1,692 lf would be required to be installed

Miscellaneous Comments

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|----------------|---|
| Flood Level -- | The proposed septic tanks and leachfield system are not located within the 100-year flood plain. |
| Odors -- | No obnoxious odors are anticipated from a properly operated system of this type. |
| Noise -- | No noise is generated by the systems. |
| Visual -- | No change. |
| Access -- | Existing vineyard and open space. Warning signs indicating the location of the leachfield are to be placed around the perimeter of the leachfield. |
| Solid Waste -- | Screenings from the process wastewater stream will be collected and composted on site and ultimately reapplied to the vineyard. Septic/settling tanks will be pumped once every three years to remove accumulated solids. |

