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Wastewater Feasibility Study

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RECEIVED
MAR 10 2016
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Kim Withrow, Supervising REHS
Napa County Department of Environmental Management
1195 Third Street, Suite 310
Napa, Ca. 94559

Re: **Septic System Feasibility Report for Proposed Taylor Family Winery**, Sandy Taylor-Carlson, President of Family Taylor Vineyards 5991 Silverado Trail, Napa, Ca. AP # 039-040-016

Dear Kim:

Sandy Taylor-Carlson and Taylor Family Vineyards will soon be submitting an application for a Use Permit for a New, Small Winery for the address mentioned above. The Use Permit application will show a proposal to build a small winery that will produce up to 15,000 gallons of wine per year. The owners wish to convert an existing building into the new small winery and move their production to the property on Silverado Trail.

CURRENT SETTING

Jerry and Pat Taylor built their lovely family home in 1976 upon 23 acres on the Silverado Trail. That is the year that the septic system was installed. In 2002, Taylor Family Vineyards was created and they began producing red and white wine off site. They currently produce their wines at their facility on Enterprise Way in Napa and at B Cellars in Oakville. Taylor Family Vineyards would like to build and operate a production facility along with wine tasting onsite.

SOIL TYPE INFORMATION

On the upslope area of the Taylor Family property we find the Kidd Loam soil type, known as a well - drained soil series in the sloping terrain of the parcel for septic systems. The Kidd Series is known as an acceptable for shallow types of septic systems. This is where the proposed septic system for this project will be located.

The USDA Soil Survey Manual for Napa County clearly identifies the soil to be the Kidd Loam Series in the uplifted terrain of Napa Valley. The manual identifies this area to be formed as an "uplifted side slope" that overlays a fractured rock parent material. These soils are generally shallow and well drained and good for septic system purposes.

I performed a profile hole evaluation of this parcel (August 18, 2014). My observation of the soil condition matches the Soil Survey Book. The site evaluation found soil conditions acceptable for a Shallow Trench Pressure Distribution System that will be placed at a depth of 36 and will have 24 inches of gravel below the pressurized distribution pipe. The field texture is Sandy Clay Loam to a depth of 62 inches (in holes A and B), overlaying a transition to a gravelly loam to fractured rock formation below. The soil structure is strong angular blocky, and the application rate was determined to be 0.80 gallons per square feet per day (as discussed and determined by Napa County staff in the field).

The soil around Hole C indicated acceptable soil conditions to a depth of 39 inches. The soil texture is sandy clay loam, with strong angular blocky structure overlaying a transition to a fractured rock formation. The soil evaluation report identified that a Subsurface Drip Dispersal System as the proper wastewater disposal system in the vicinity of Test Hole C. The wastewater for a Drip System would require pre-treatment, and the soil application rate would be reduced to .60 gallons per square feet per day. This test hole will be used for expansion area.

PROPOSED DOMESTIC WASTEWATER GENERATION (DW)

The project for the Taylor Family Vineyards and the Use Permit application is for:

- Small winery to produce up to 15,000 gallons of wine per year
- Structure will be less than 5,000 square feet
- Employees will be 1 FTE and 1 PTE
- Up to 17 wine tasters/visitors per day, by appointment only
- Up to 10 Wine Club Marketing Events per year up to 30 persons
- One wine Auction/Marketing Event up to 75 persons per year
- No food preparation onsite, no commercial kitchen onsite

The Winery will hire licensed caterers to prepare food products or meals offsite (at licensed kitchens) for Marketing Events. For wine tasting only, the Napa Design Regulations call for 3 gallons per visitor per day. For catered dinners, designers typically use 5 gallons of wastewater per guest. As such, up to 150 gallons (30 guests x 5 gal/guest) of domestic wastewater could be produced for catered events. Plates, silverware, utensils, pots, pans and serving trays will be taken by the caterer offsite to be cleaned and sanitized. As such, a Food Permit from the Health Department is not required.

Using Table II of the Napa County Onsite Regulations, the domestic wastewater flow is calculated at:

Typical Daily Domestic Flow:

1 FTE Employees	x 15 gallons per employee per day	= 15 gals per day ¹
1PTE Employee	x 7.5 gallons per day	= 7.5 gals per day
17 Visitor /day	x 3.0 gals per visitor per day	= 51 gals per day
Total Domestic Wastewater of 73.5, say 75 gallons per day		

The Use Permit Application proposal is to allow 10 Catered Food/ Wine Events per year at the winery. Using the Metcalf & Eddy Engineering Design Book and Table 4, Napa County Regulations for Alternative Septic Systems, we use 5 gallons per day per person for a catered food events (with use of single serve utensils).

Catered Event Flow:

3 Employees from caterer	x 15 gals/employee for event	= 45 gals/day
2 Winery Staff	x 7.5 gals/day	= 15 gals/day
30 Guests for catered event	x 5 gals/guest/event	= 150 gals/day
Total Catered Event of Domestic Waster is 210 gallons per day peak flow		

For the one Wine Auction/Marketing Event/year up to 75 persons per year, there will be:

3 Employees from caterer	x 15 gals/employee for the event	= 45 gals/event
2 Winery Staff	x 7.5 gals	= 15 gals/event
75 Guests maximum for the event	x 5 gals	= 375 gal/event
Total DW for the event is		= 435 gals/event

In the state of California, designers are required to design and install maximum water saving fixtures on all plumbing devices in commercial and residential facilities as per the Uniform Plumbing Code. In Napa County, we have had several similar facilities install water saving devices, and the monitoring has shown that the water use is less than predicted (Verismo Winery and Bouchaine Winery are two of the latest Use Permit Applications). We have seen up to 50% reduction in water consumption.

So, for the Taylor Family Vineyard Winery, I will assume a 35% reduction in water use for the design. As such, this report finds that the real time wastewater (domestic wastewater production will be):

Typical Daily Domestic Flow: 80 gals/day	
- (.35%) reduction of 28 gals =	52 gals/day

Catered Event Flow: 210 gals/evert flow	136.5 gals/event-
(.35% reduction of 73.5 gals) =	

Wine Auction Marketing Event: 435 gals/event flow
35 reduction of 152 gals) =

283 gals/event

Review: from the calculations above, you can now see that the actual daily wastewater flow will average around 52 gallons per day. Catered Marketing Events (up to 10 events per year), will create 136.5 gallons per event. Finally, the one Major Wine Auction Marketing Event (up to 75 persons), will generate up to 283 gallons of domestic wastewater for that event. The highest Peak Flow will be the one day per year where the Winery is open for tasting and they have the Wine Auction Marketing Event. On that one day per year, we see that the DW will be (283 gals + 52 gals = 336 gals of Peak Winery Domestic Flow.

For purposes of the Use Permit", I will take the domestic wastewater from the winery, and connect the plumbing to a 2,000 gallon two compartment septic tank downhill from the winery (into the area known as the Tank Farm). At the Tank Farm, the DW from the winery will enter a sump (to be called the Master Sump) and will pump the wastewater to the STPD Septic System (that I previously mentioned in this report).

PROCESSED WASTEWATER PRODUCTION

The Processed Wastewater (PW) will come from the Winery Crush Pad and Floor Drains of the Wine Production Building. The domestic wastewater from the Winery will exit the building with its own wastewater pipe (3 or 4 inch ABS Sch. 40 pipe – with minimum of 2% fall: then enter its own 2,000 gallon two compartment septic tank. The wastewater from this septic tank will enter the Master Sump that pumps wastewater to the STPD Leachfield. So, in review: there will be two different plumbing lines that exit the Winery. One line for Domestic Wastewater (toilets, sinks, hand wash sinks, drinking faucets). And a separate Processed Wastewater (PW) plumbing line (floor drains, floor sinks, and drain from the crush pad). PW exits the building into its own septic system.

PROCESSED WASTEWATER PRODUCTION

The proposed facility is intended to produce up to 15,000 gallons of wine per year. The Napa County Regulations for determining processed wastewater peak flow is based upon a formula, namely:

$$\frac{15,000 \text{ gallons/wine/year}}{30 \text{ day crush period}} \times 1.5 = 750 \text{ gallons PW peak per day during the crush season}$$

During the winter season (November through March), at non-crush months, the PW is very little. Typically less than 100 gallons per week. The only PW will come from barrel washing, racking, spills, bottling (spills), and general wash down and cleaning from the

floor into the floor drains. Remember, this is a small winery. And Taylor Family Winery produces both red and white wines, and actually have longer crush periods that just 30 days.

Note: Taylor Family Vineyards has been producing their own wines since 2002. They typically have a longer crush period and produce red wine which is harvested later in the fall months.

PROPOSED SEPTIC SYSTEM FOR PW

The proposed crush pad for Taylor Family Vineyards will be covered and protected from the potential inflow of rainwater. The crush pad will have a solids screen over the drain. The crush pad drain will connect by gravity into the septic tanks.

The winery building will have slotted and screened floor drain, where spillage of wine from barrels, racking, bottling, and floor cleaning and wash down will enter the plumbing system, and connected outside the building into the septic tanks. High pressure hoses with low volume nozzles will be used for wash down.

The Taylor Winery has three Options for PW Treatment and Dispersal.

Option One: Is to take the PW and install a **Hold and Haul PW System**. Here, all PW will be plumbed into an enlarged, watertight, holding tank. Based upon the Crush Peak Flow of 750 gallons per day, that tank size will be 7,000 gallons in capacity (or larger). The holding tank will have three risers and access lids for safe and easy removal of all materials inside the holding tank. The holding tank will have a light and alarm system installed to alert the operators of the need to pump the tank. The high water alarm float will activate when the volume of the tank is at 6,000 gallons. The septic tank hauler will be notified to pump the tank. He/she will then pump the material as needed and haul the PW to the City of Oakland. Here, the PW will be disposed of into the Anaerobic Digester Public Treatment Plant and the waste is converted into electricity.

Dependable Septic Tank Pump Company of Napa County will be the licensed and certified hauler of the PW for Taylor Family Winery. They will be under contract to pump and haul as needed. It is anticipated that during the Crush Season, 22,500 gallons of PW could be generated (peak flow). At a pumping of 7,000 gallons per pumping, that would equivalent to 3.2 times per crush season. During the remainder of the year, there is barrel transfer, barrel washing, bottling, and spills. Our experience indicates that another 400 gallons per month of PW is typically generated. So, at 400 gallons per month, that is approximately 4,400 gallons per year of wash down PW. So, the estimated number of Hold and Haul trips per year is four to five trips per year.

At the design process, the Hold and Haul Tank may be a Jensen Concrete Modified Septic tank. Or the Xerces Fiberglass Commercial Modified Septic Tank may be installed. In either case, the tank would have to be installed as per manufacturers specifications and be watertight. The Hold and Haul tank would have to be installed into the ground so as to be level and have proper dirt backfill.

Option Two. Is to take the Hold and Haul System and convert it into a NSF 350 Approved Bio Microbics Biobarrier MBR Wastewater Treatment System. This system is the newest in technology. We have designed and installed it at the Hyde Family Winery on Carneros Rd., Napa. In this case for Taylor Family Winery, the 7,000 gallon Hold and Haul Tank would be fitted into the Treatment Tank of the MBR System. Here, a pre-engineered, BioBarrier® Membrane BioReactor module would be installed into this converted treatment tank. A Bio Aeration Grid System would also be installed that includes grids, blowers, blower vents and a control panel for optimal aeration.

A settling tank with a SaniTEE® Effluent Screening Device (effluent filter), would be installed before the Treatment Tank. The size of the settling tank is approximate 3,000 gallons in size. It basically is a Septic Tank. Here, solids start to separate before entering the treatment tank.

A Filtrate Pump is installed into the treatment tank. Here, the highly treated PW is then taken to a Storage Tank to incorporate into the existing Drip Irrigation System at Taylor.

The size of the treated water storage tank has not been determined. But since the irrigation system is already in place, it is estimated that the capacity will be generally in the size of 5 to 6 thousand gallons. The storage tank will be labelled "Treated Wastewater". The water quality of the treated PW will meet NSF Standard 350, which is a very high level of treatment in the State of California.

A licensed and certified Onsite Wastewater System Operator will operate and maintain the MBR System.

Option Three: PW dispersal by way of integration into the proposed DW STPD System. Earlier in this report, I mentioned that we found acceptable soils for a Shallow Trench Pressure Distribution System. The area for disposal is large enough to install a STPD for the Domestic and Processed Wastewater System combined. In fact, there is enough area here to incorporate the domestic wastewater from the existing residence on the property.

So, in this option, we will incorporate PW into the Master System (domestic wastewater for the winery, the existing residence).

In this option, we will install a 2,000 gallon effluent filter tank to help in reducing suspended solids, seeds and pomace. Inside this tank, there will be 4 – San Tee Bio Microbic Effluent Filters. The effluent filters will slow down the flow of PW through the system and improve the settling of solids. The effluent tank will have a removable lid for easy servicing and cleaning. This tank will be cleaned four times per year. The PW then enters the Master Sump for pumping to the Shallow Trench Pressure Leachfield.

MASTER SUMP

A Master Sump, wastewater from two other sources will combine into the master sump. This includes the Domestic Wastewater from the Winery and the Domestic Wastewater from the existing house that was constructed in 1975. The capacity of the Master Sump must be two days peak flow. So for Option One, it must be a minimum of a 2,000 gallon sump. If Option Three is even used, it would have to be a 3,000 gallon sump.

GENERAL LAYOUT OF PW WASTEWATER

CRUSH PAD, FLOOR DRAINS - PW gravity flows into

Option One: -

7,000 GAL PW Hold and Haul Tank – pump on demand – haul away

Option Two:

Add a 3,000 Gal Settling Tank before the 7,000 Gal Holding Tank

Convert the 7,000 Gal Hold and Haul Tank into MBR Treatment System

Treated water is placed into a Storage Tank and incorporated to vine irrigation

Option Three: -

Add 2,000 Gal Effluent Filter Tank after the 7,000 Gal Hold and Haul Tank –

Plumb into the Master Sump –

Add additional STPD Leachlines for increased PW flow

Plumb into the Master Sump to go to STPD System

THE EXISTING FAMILY RESIDENCE

As mentioned earlier in this document, there is the four bedrooms Family Residence that was constructed in 1976. It is the desire of the Family to upgrade this existing septic system to meet current standards. The existing septic system for the house consists of a septic tank by the residence and standard leachlines uphill of the vineyard.

To upgrade this septic system (which is voluntary), we will retrofit the house with low flow water saving device fixtures (replace toilets, shower heads, and install water flow restrictors) to reduce the water flow into the house.

We will replace the existing septic tank with a new, 2,000 gallon concrete, IAPMO approved and watertight septic tank (close to its current location). Then install a new gravity wastewater line down the hill then tie into the Master Sump.

COMBINED DW AND PW WASTEWATER DISPOSAL SYSTEM

The STPD disposal system will consist of pressure dosed leachlines. The size of the system is determined by:

COMBINED Flow: Winery Peak Flow is 283 gals/day + 53 gals of Winery DW + 480 gallons from the Residential System = 816 gallons at peak combined wastewater flow

So the STPD System would be calculated at: 816 gals divided by (0.8 gals/sq.ft. x 3 sq.ft./lineal foot) = 340 lineal feet to be installed.

If Option Three is ever incorporated: then we would have to include 750 gals/d of PW. So add 750 gals of PW to 816 gals of DW = 1566 total flow. And expand the STPD System by adding 313 lineal feet.

NOTES FOR OPTION TWO

The Taylor Family may one day consider spending the additional funds that will be used to install a BioMicrobics MBR Wastewater Reuse System. Their reason for this consideration is that the State of California is entering its fourth consecutive years of drought. The governor has issued mandatory water Reuse or Water Saving Restrictions on businesses throughout California.

This Option will allow the Taylor Family to reuse treated wastewater in the current drip irrigation system for the grape vines. It is the ideal Agricultural Goal in Napa County and State Wide to reuse treated wastewater wherever possible. This will be an ideal use.

FEATURES TO BE INCLUDED WITH THE REUSE SYSTEM

SETBACKS

Meeting minimum setbacks is vital to all wastewater projects. In the case of the Taylor Family Vineyards, the septic tanks, gravel filter, sumps, master sump, leachfield, MBR and water reuse drip disposal system would all have to meet a minimum setback to all and future water wells. They would have to also meet minimum setbacks to existing and proposed roads and roadside ditches (25 feet). This will be shown on future plans and specifications for the wastewater systems.

OTHER ITEMS

- 1) A water supply permit is not required for the project and Use Permit,
- 2) The Crush Pad must have a cover over the area to prevent rain intrusion into the collection system,
- 3) The septic system will be considered to be an Alternative Sewage Disposal System. As such, Napa County regulations now require that Alternative Systems follow the new Monitoring and Reporting Program by a certified provider. Monitoring must be performed every six months, with results provided to Napa County Environmental Health. In addition, the owner must apply for and received an Annual Operating Permit to own and properly operate the Alternative Septic System (Note: P and R Septic Systems is a certified installer and service provider).
- 4) The septic system plans will have to go through plan review and permitting with Napa County Environmental Management.
- 5) The STPD system will be designed to follow contour of the ground, and there will be monitoring wells installed uphill, within, and downgradient of the system for monitoring purposes.

SUMMARY

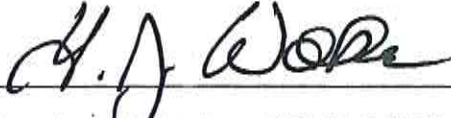
The Septic System Feasibility Report carefully demonstrates that the septic system needs for the proposed small winery are addressed. The Taylor Family has carefully planned, met, and exceeded county requirements in terms of septic system requirements.

As their consultant with years of experience in Onsite Wastewater System Design, I find that the Wastewater Dispersal System Design for the Domestic and Processed Wastewater Systems will meet or exceed the Napa County requirements. I also find that there is more than 100 percent expansion area for this project.

It is the desire of Taylor Family Vineyards to process the Use Permit with the Option One Hold and Haul System for the PW. And to proceed to the Option Two treated PW System at some day in the future when funds are available.

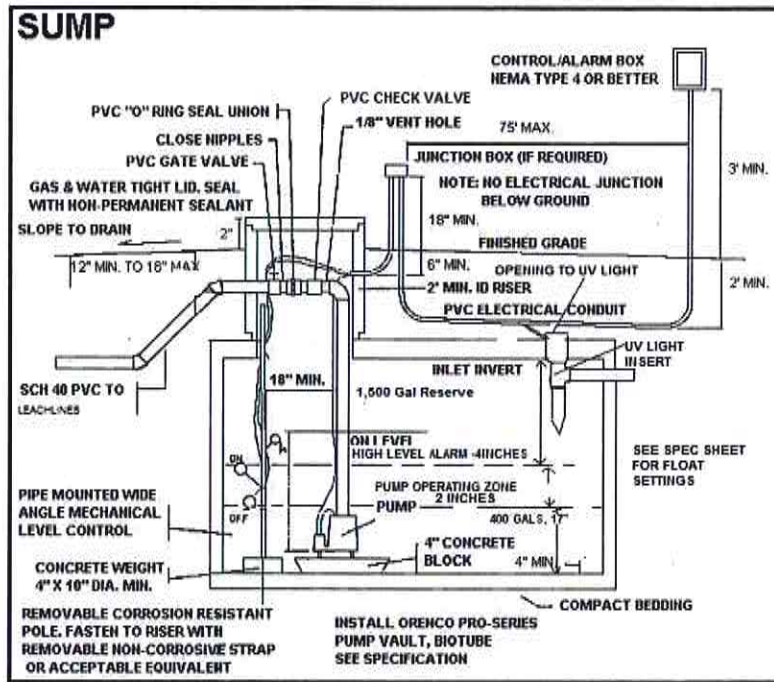
I support the project and the proposed uses in the Use Permit Application. Should you have questions please contact me at 707-486-1405 or 829-7936.

Yours truly,

A handwritten signature in black ink, appearing to read "T. J. Walker", written over a horizontal line.

Theodore J. Walker, REHS #4323

TYPICAL DETAILS



TYPICAL SEPTIC TANK DETAIL

