

September 29, 2015

TO: Vintage Wine Estates

FROM:



Jeremy Kobor, MS, CFM



Matthew O'Connor, PhD, CEG
O'Connor Environmental, Inc.



SUBJECT: Summary of Water Availability Analysis findings and response to 08/18/15 letter from Shute, Mihaly, and Weinberger concerning the proposed Girard Winery

Overview

This letter summarizes the findings from the Water Availability Analysis (WAA) completed in March 2015 for the Girard Winery by O'Connor Environmental, Inc. (OEI). The letter also addresses water availability related aspects of the 08/18/15 letter from Shute, Mihaly, and Weinberger LLP and the attached Technical Memorandum (TM) from Tom Meyers. The specific items that are addressed concern groundwater recharge, trends in groundwater elevations, potential for neighboring well interference, and potential for impacts to the Napa River.

A brief summary of the key aspects and findings from the WAA and the TM review is provided below:

- **Groundwater Depletion:** The total expected water use (existing and proposed) on this project is 8.2 ac-ft/year. The total mean annual recharge on this parcel is 34.6 ac-ft/year. Given that the proposed demand is less than 25% of the recharge, there is no basis for concluding that groundwater pumping for this project would result in reduced water availability in the aquifer over time.
- **Well Interference:** The nearest neighboring well is 541 ft away from the Clos Pegase well, and 747 ft away from the Girard well. The Napa River is 1,500 feet away from the nearest project well. Our calculations clearly show that there is no basis for concluding that significant drawdown at these neighboring wells or impacts on the Napa River would occur as a result of the proposed project.
- The TM raises certain fears and concerns about aquifer conditions, however the data presented in the 2014 Napa County Groundwater Monitoring Report indicates stable groundwater elevations over the last 30 to 40 years.
- The TM does not present any significant new data or analysis and consists primarily of generalized arguments that do not relate to actual project conditions.

Summary of March 2015 Water Availability Analysis

The WAA completed by OEI in March 2015 consisted of hydrogeologic characterization, recharge and water use estimation, and well and river interference analysis for the proposed project. The hydrogeologic characterization was based on interpretation of available geologic maps, driller's logs for the project wells, and previous groundwater investigations. The project wells withdraw water from the tuffaceous unit of the Sonoma Volcanics. This unit is exposed throughout a large portion of the western hills of the northern Napa Valley and is overlain by alluvial deposits in the vicinity of the project parcel and throughout much of the northern Napa Valley. Static water levels and water level responses to pumping at the project wells indicate that groundwater beneath the project parcel occurs under confined or partially-confined conditions.

Luhdorff and Scalmanini (2013) applied a Root Zone Water Balance Model and estimated that mean annual groundwater recharge between 1976 and 1983 was on the order of 8.8 inches per year in the watershed area above the Napa River at Calistoga USGS gauging station. Applying these recharge estimates to the area of exposed tuff up-gradient of the project parcel indicated that mean annual recharge to the project aquifer was ~2,936 ac-ft/yr and varied from 575 ac-ft/yr during the drought conditions of 1977 to 4,943 ac-ft/yr during the wet conditions of 1983. Expressed as a parcel-based recharge value, the mean annual recharge on the project parcel was estimated to be ~34.6 ac-ft/yr. These are likely under-estimates of the total recharge since the approach does not account for recharge through the alluvium or recharge from streambed infiltration which may be significant additional sources of recharge to the project aquifer.

The total Proposed Demand which includes the Existing Water Use on the Clos Pegase parcel and the Proposed Water Use on the Girard parcel is expected to be ~8.2 ac-ft/yr. This use represents ~24% of the parcel-based groundwater recharge and less than 0.3% of the total aquifer recharge. Given that the Proposed Demand is significantly less than the mean annual groundwater recharge it is unlikely that the proposed groundwater pumping would result in reduced water availability over time.

A constant rate 24-hr pump test with a pumping rate of 5.4 gal/min was performed on the Girard Well in February of 2015. The resulting time/drawdown data was used to estimate aquifer properties and the extent of the expected lateral drawdown away from the project wells. Using the median estimates of Transmissivity (T) and the Storage Coefficient (S) revealed that maximum drawdown at the Girard Well was 18.7-ft which diminished quickly with distance from the well to less than 5-ft at a radius of 60-ft and less than 1-ft at a radius of 404-ft.

The closest neighboring well to the Clos Pegase Well is 541-ft away and the closest neighboring well to the Girard well is 747-ft away. At these distances, the anticipated drawdowns would be less than 1-ft. The Napa River is ~1,500-ft away from the project wells, and more than 7 days of continuous pumping would be required before the cones of depression from the wells would extend this far. Even under this extreme scenario, this hypothetical drawdown would occur within the tuffaceous aquifer and not within the overlying alluvium that is in direct hydraulic connection to the Napa River; a lack of observed water level response to pumping in the project sump adjacent to the Girard Well during the pump test suggests that hydraulic connection between the tuffaceous aquifer and the overlying alluvium is minimal in the area.

Response to August 2015 Letter

Groundwater Recharge

The Tom Meyers TM asserts that the recharge estimate from the March 2015 WAA is "not accurate because it does not account for differing ability of the formation to accept recharge". The recharge estimate was based on application of watershed average recharge rates determined by Luhdorff and Scalmanini (2013) for the watershed area up-gradient of the Napa River at Calistoga USGS gauge. This watershed area includes a wide variety of soil, land cover, and geologic conditions, and thus the estimates represent the composite recharge occurring across an area with varied recharge potential. In addition to the tuff of the project aquifer, this area includes alluvium which as Meyers notes has a hydraulic conductivity several orders of magnitude higher than the tuff.

What Meyers fails to note is that the majority of the watershed area consists of other units of the Sonoma Volcanics which have hydraulic conductivities several orders of magnitude lower than the tuff. Thus one would expect that recharge would be higher than the Luhdorff and Scalmanini (2013) estimates in areas underlain by units with high recharge potential such as the alluvium and lower in areas underlain by units of low recharge potential such as the low permeability units of the Sonoma Volcanics which comprise the majority of the watershed area.

Given the fact that the WAA used a recharge estimate representing average watershed conditions across a variety of geologic units of varying recharge potential and applied them to an area of moderate to high recharge potential, the estimate should if anything under-estimate the project aquifer recharge. Additionally, the recharge estimate did not account for recharge through the alluvium or for recharge from streambed infiltration which may be significant components of the total recharge. This also suggests that if anything the WAA recharge estimates are underestimated.

The total Proposed Demand for the existing Clos Pegase and proposed Girard wineries represents only ~24% of the parcel-based groundwater recharge and less than 0.3% of the total aquifer recharge. This suggests that there is a significant margin of safety available to account for uncertainties in the estimates of recharge and water use and that even if one assumed recharge was as low as 25% of the estimated value, proposed water use would still remain less than mean annual recharge.

Trends in Groundwater Elevations

The 2014 Napa County Groundwater Monitoring Report shows hydrographs for four wells in the Calistoga area. Well 127 shows a trend of declining groundwater elevations from 1970 to 1985 and then relatively stable elevations from 1985 to 2014. The lowest elevations in the record occurred during the dry water year of 2012 and these elevations recovered fully in 2013. Wells 128 and 129 show very stable conditions since 1980 and Well 130 shows stable conditions since 1970. The lowest elevations occurred during the 1970s at Wells 128 and 129, however the lowest levels occurred in recent years including 2014 at Well 130.

Meyers notes that the hydrographs "show the effects of pumping and drought with recovery during wet years". We agree that the hydrographs show groundwater elevations decline during

dry water years and recover during subsequent wetter periods. These year to year fluctuations in response to climate variability are typical of many aquifers. Importantly, the hydrographs show that groundwater elevations recover following periods of drought and overall indicate relatively stable elevations over the last 30 to 40 years.

Potential for Impacts to the Napa River

The Tom Meyers TM discusses the fact that water levels in the Girard Well increased by about 10-ft over the 11-day monitoring period discussed in the WAA and he presents a hydrograph for the Napa River at Napa showing a period of significant discharge occurring several days prior to the monitoring period. Meyers attributes these increases in elevation at the Girard Well as resulting from recharge from the river but does not present any evidence to support this theory.

Two significant rainstorms occurred several days prior to the monitoring period which began on 2/12/2015. More than 4.8 inches of precipitation was recorded at the Napa River at Dunaweal Lane rainfall gauge between 2/6/2015 and 2/8/2015, and as Meyers notes the corresponding runoff hydrographs are captured at the Napa River gauge. This rainfall most likely also resulted in groundwater recharge to the tuffaceous aquifer and to the overlying alluvium given that 4.8 inches in 72 hours is a significant rainfall event for the area. This infiltration recharge and/or groundwater inflows from the large portions of the aquifer up-gradient of the well are more likely what led to the trend of increasing water levels at the Girard Well.

Evidence to support the notion that the project aquifer is not in direct hydraulic connection with the overlying alluvial aquifer which supplies baseflow to the Napa River includes the fact that, a) static water levels at the project wells are 15 to 20-ft below the elevations of the riverbed, and b) water levels in the alluvial aquifer did not exhibit a response during pumping of the project well as observed at the project sump.

Meyers goes on to say that "every change in pumping from wells near a river will affect the river's flow gradient; that is simply well hydraulics". This statement may be true in the simplest case of an unconfined alluvial aquifer in full connection with a river, however it completely ignores the hydrogeologic complexity of conditions surrounding the project aquifers. The project wells are withdrawing groundwater occurring under confined conditions in the tuffaceous aquifer not from the overlying alluvium that supplies baseflow to the river. The evidence presented above suggests a lack of hydraulic connection between the alluvium and the tuffaceous aquifer; thus the water abstracted from the project wells is much more likely being supplied from inflows from up-gradient portions of the tuffaceous aquifer rather than from river flows.

Potential for Impacts to Neighboring Wells

The Tom Meyers TM asserts that the WAA misapplied the Cooper-Jacob method in identifying the edge of the cone of depression associated with pumping of the project wells because the point of zero drawdown does not actually occur in the field. This statement is theoretically true, however it is common practice to apply this or a similar method for determining the extent of the zone of influence surrounding a pumping well. Regardless, the Napa County Water Availability Guidance Document specifies the well interference criteria as a maximum allowable drawdown of 10 to 15-ft. So the question of whether drawdown is zero or drawdown is very small but not quite zero is irrelevant.

Meyers presents new Theis calculations which show that at a distance of 1,000-ft from the project wells, drawdown would be about 8-ft after 11 days of pumping at 5.8 gpm. The WAA shows that the total proposed water demand can be met with a pumping rate of 10 gpm and a schedule of 10.5 hours on and 13.5 hours off to allow for aquifer recovery, thus continuous pumping for 11 days is not a realistic assumption. Nevertheless, Meyer's own calculations show that even if pumping durations were this long, the criteria of less than 10-ft of drawdown would still be met at a distance of 1,000-ft.

For additional clarity, the mean estimates of T and S from the WAA were used to solve Equation 1 (Cooper and Jacob, 1946) to determine the amount of drawdown at the closest neighboring well (541 ft) resulting from 24 hours of continuous pumping at 10 gpm. Equation 1 is as follows:

$$s = 2.3Q/4\pi T \log (2.25Tt/r^2S)$$

where s = drawdown in feet, Q = pumping rate in ft^3/day , T = Transmissivity in ft^2/day , t = duration of pumping in days, r = distance from the pumping well in feet, and S is the Storage Coefficient. The resulting drawdown at the closest neighboring well is only 0.05-ft. In order for drawdown to exceed the 10-ft well interference criteria, 117 days of continuous pumping would be necessary. Again, the total proposed demand can be met with only 10.5 hours of pumping and this hypothetical exercise clearly demonstrates the unlikelihood that well interference will occur.

Summary

The Tom Meyers Technical Memorandum did not present any significant new data or analysis that would lead to necessary reinterpretation of the findings of the March 2015 WAA. The WAA clearly demonstrates that the Total Proposed Demand for water is significantly less than the parcel-based mean annual recharge, and that pumping from the project wells is highly unlikely to result in significant effects to neighboring wells or the Napa River.

September 25, 2015



Mr. Pat Roney
Girard Winery
205 Concourse Boulevard
Santa Rosa, CA 95403

Consolidated Traffic Analysis for Girard Winery

Dear Mr. Roney;

W-Trans has prepared two traffic study reports for the Girard Winery Project, including the original "Traffic Study for the Girard Winery Project" dated December 18, 2014, and a subsequent response-to-comments letter dated April 9, 2015. To make this information easier for policymakers, staff members and the public to use, the two letters have been consolidated into this single report, which essentially supersedes both of the previous reports. Note that any substantially new information has been indicated in underlined text, for ease of review.

Study Area

The project site is located on the east side of Dunaweal Lane between Silverado Trail and State Route (SR) 29, and is currently vacant. Dunaweal Lane is a two-lane roadway that runs north-south, and is designated as a local roadway. The posted speed limit on Dunaweal Lane is 45 miles per hour (mph).

Two intersections were identified by County staff for analysis.

Silverado Trail/Dunaweal Lane is a tee intersection with stop controls and flared right-turn lane on the northbound terminating Dunaweal Lane approach.

SR 29/Dunaweal Lane is stop-controlled with flared right-turn lanes on both the northbound and southbound Dunaweal Lane approaches.

The study area was selected to include the two locations where the project would generate the highest number of vehicle turning movements, which in turn would reflect the locations with the greatest potential transportation impacts. Beyond these two intersections the added trips would be almost entirely comprised of through movements, which are generally not the critical movements for a corridor such as SR 29. Further, the number of project-generated trips would be considerably lower at locations further from Dunaweal Lane as the trips disperse wherever paths diverge, such as at the intersections of Dunaweal Lane with SR 29 and Silverado Trail.

Project Description

The proposed project would allow production of up to 200,000 gallons of wine annually, and operation of a tasting room for an average of 52 visitors on a weekday and 62 visitors on a weekend (or maximums of 75 and 90 visitors on a peak day, respectively). The project would have eight full-time employees and three part time employees on-site during weekdays as well as two full-time employees and four part-time employees on weekends. Vehicular access to the project site would be provided via a full access driveway on Dunaweal Lane. The most recent site plan, dated February 4, 2014 is enclosed.

Existing Volumes

Mechanical tube counts were collected on Dunaweal Lane near the project site on three consecutive days in March 2014 (Thursday through Saturday). Intersection counts were taken during the p.m. peak period in September 2014 at Silverado Trail/Dunaweal Lane and SR 29/Dunaweal Lane. The existing traffic volumes on Dunaweal Lane are summarized in Table 1. The volume of traffic ranged from 1,484 on Thursday to 1,691 vehicles on Saturday;

this would be considered relatively low and reflects the volumes that would be generated by a residential subdivision having fewer than 20 homes.

| Study Segment | Friday | | Saturday | |
|----------------------|--------------|------------|--------------|-------------|
| | Daily Trips | PM Peak | Daily Trips | Midday Peak |
| | NB/SB | NB/SB | NB/SB | NB/SB |
| Dunaweal Ln | 828/746 | 68/90 | 880/811 | 101/77 |
| Total (NB+SB) | 1,574 | 158 | 1,691 | 178 |

Existing Conditions

Intersections

Using the turning movement data collected at the two study intersections together with the current configurations, existing operating conditions at each intersection were evaluated. As shown in Table 2, both intersections are currently operating at LOS A or B overall and on all approaches. Copies of the calculations for all scenarios are enclosed.

| Study Intersection Approach | Existing Conditions | | Existing plus Project | |
|---------------------------------|---------------------|-----|-----------------------|-----|
| | Delay | LOS | Delay | LOS |
| 1. Silverado Trail/Dunaweal Ln | 1.8 | A | 1.8 | A |
| Westbound (Silverado) Left-turn | 7.6 | A | 7.6 | A |
| Northbound (Dunaweal) Approach | 8.9 | A | 8.9 | A |
| 2. SR 29/Dunaweal Ln | 0.9 | A | 0.9 | A |
| Northbound (Dunaweal) Approach | 9.7 | A | 9.7 | A |
| Southbound (Dunaweal) Approach | 11.6 | B | 11.6 | B |
| Eastbound (SR 29) Left-turn | 8.9 | A | 8.9 | A |
| Westbound (SR 29) Left-turn | 8.1 | A | 8.1 | A |

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

According to Policy CIR-16 of the *Napa County General Plan, 2008*, "No single level of service standard is appropriate for un-signalized intersections, which shall be evaluated on a case-by-case basis to determine if signal warrants are met." For analysis purposes it was assumed that the impact would be significant if project-added traffic caused operation to fall to LOS E or F on an approach for which the Peak Hour Volume Signal Warrant is met.

With all approaches at LOS A or B, the current operation of both intersections would be considered acceptable. While weekend operation was not evaluated, given the similarity of volumes on a weekday versus a weekend day together with the very low average delays currently being encountered, it appears reasonable to conclude that operation during the weekend peak period is also low and therefore acceptable.

Roadways

Information in the *Napa County General Plan Update Draft Environmental Impact Report*, February 2007 (GPUDEIR), indicates that under 2003 volumes SR 29 was operating at LOS D between Lodi Lane and Deer Park Road (this is the nearest segment included in the analysis). Silverado Trail is identified in the same document as operating at LOS C under 2003 volumes.

Policy CIR-16 of the Napa County General Plan also provides guidance for roadways, indicating that, "The County shall seek to maintain an arterial Level of Service D or better on all county roadways, except where maintaining this desired level of service would require the installation of more travel lanes than shown on the Circulation Map." Both SR 29 and Silverado Trail are shown as 2-lane Rural Collectors on the Circulation Map (Figure CIR-1). A one-percent criteria for the threshold of significance is used for this analysis because it is well within the range of daily variation in traffic as well as the range of accuracy of travel demand forecast models and therefore not likely to be noticeable to drivers.

The traffic study relies on both the Caltrans and County standards of significance which indicate that operation at LOS C or better is acceptable, though for facilities operating at service levels below this threshold, an increase which is less than one-percent of cumulative volumes is considered less-than-significant. The CEQA checklist has traditionally been interpreted such that if acceptable operation is maintained, then the increase is not considered substantial in relation to the existing traffic load or capacity of the street system.

Collision History

The collision history along Dunaweal Lane between Silverado Trail and SR 29 was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on the collision data available from the California Highway Patrol as published in their *Statewide Integrated Traffic Records System* (SWITRS) reports during a five-year period between January 1, 2007, and December 31, 2011. The calculated collision rate for the study segment was compared to the average collision rate for similar facilities statewide, as indicated in *2010 Collision Data on California State Highways*, California Department of Transportation (Caltrans).

The statewide average collision rate for a rural two-lane, flat road with a speed limit of 55 mph or less is 1.05 collisions/million vehicle miles (c/mvm). Over the five-year study period, seven collisions were reported on Dunaweal Lane between Silverado Trail and SR 29, for a calculated collision rate of 0.90 c/mvm, which is lower than the statewide average for similar facilities. Further, no injuries or fatalities were reported during the five-year study period. The collision rate calculation spreadsheet is enclosed.

Future Volumes

Future projected traffic volumes were obtained from the Solano Transportation Authority (STA) who maintains the joint Napa County/Solano County 2010-2030 Travel Demand Forecasting Model. These future volume projections assume full build-out of all currently vacant parcels based on their development potential, so would reasonably be expected to encompass development both in the County and in the neighboring communities of Calistoga and St. Helena, such as the Enchanted Resorts and Silver Rose projects.

The data used included directional segment volumes along SR 29 and Silverado Trail for the p.m. peak hour. Using the 2030 and 2010 model volumes a growth factor of 1.45 was determined for SR 29. This growth factor was applied to turning movements to and from Dunaweal Lane and the remainder of the future increase was added to the volumes for the through movements. It is noted that the 78 vehicle trips added to Dunaweal Lane during the p.m. peak hour would adequately represent increases associated with three new wineries or expansions to existing wineries along Dunaweal Lane.

Future Conditions

Intersections

Based on these projected future volumes, the two study intersections are expected to operate acceptably overall, though the northbound Dunaweal approach to Silverado Trail is expected to operate at LOS E and the southbound Dunaweal Lane approach to SR 29 is expected to operate at LOS F. These results are shown in Table 3.

| Study Intersection Approach | Future Conditions | | Future plus Project | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----|---------------------|-----|
| | Delay | LOS | Delay | LOS |
| 1. Silverado Trail/Dunaweal Ln Westbound (Silverado) Left-turn Northbound (Dunaweal) Approach | 3.9 | A | 4.9 | A |
| | 9.5 | A | 9.6 | A |
| | 38.7 | E | 45.7 | E |
| 2. SR 29/Dunaweal Ln Northbound (Dunaweal) Approach Southbound (Dunaweal) Approach Eastbound (SR 29) Left-turn Westbound (SR 29) Left-turn | 9.6 | A | 12.4 | B |
| | 20.3 | C | 20.7 | C |
| | ** | F | ** | F |
| | 11.4 | B | 11.4 | B |
| | 8.7 | A | 8.7 | A |

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service;
** = delay greater than 120 seconds

Roadways

According to the GPUDEIR, under projected 2030 volumes SR 29 is expected to operate at LOS F in the study area and, despite substantial increases in traffic, Silverado Trail is expected to continue operating at LOS C. As previously noted, the County has exempted both of these roads from their operational standard, so the significance of project impacts is evaluated against the one-percent threshold.

Trip Generation

The anticipated trip generation for a proposed project is typically estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. However, the publication contains no such information for a winery. Therefore, the County of Napa's Winery Traffic Information/Trip Generation Sheet was used to determine the anticipated traffic that would be generated by the proposed winery and tasting room. A copy of this worksheet is enclosed.

The County of Napa's Winery Traffic Information/Trip Generation Sheet does not include guidance on inbound versus outbound trips, so it was assumed that 75 percent of trips at the winery would be outbound during the weekday p.m. peak hour since most of the trips would be associated with employees and customers leaving at closure of the winery. For the weekend midday peak hour it was assumed that inbound and outbound trips would be evenly split. A summary of the project's trip generation potential is provided in Table 4.

Table 4 – Project Trip Generation

| Land Use | Daily Trips | | Weekday PM Peak | | | Weekend Midday Peak | | |
|--------------------------|-------------|---------|-----------------|----|-----|---------------------|----|-----|
| | Weekday | Weekend | Trips | In | Out | Trips | In | Out |
| Winery plus Tasting Room | 74 | 58 | 26 | 6 | 20 | 29 | 15 | 14 |

Trip Distribution

The pattern used to allocate new project trips to the street network was determined by reviewing existing average daily traffic volumes on Dunaweal Lane. It is understood that the winery will direct employees to take SR 29 when their origin/destination is the north and take Silverado Trail when their origin/destination is the south. This results in right turns from Dunaweal Lane to the regional network, further reducing impacts at the study intersections due to project-related trips. It is recommended that clear signage that directs tasting room visitors in the same fashion be installed at the project driveway for exiting vehicles and similar directions be posted on the winery's website.

Visitor traffic accessing the site from the north via Silverado Trail and from the south via SR 29 was assumed to have an even split, while all employee trips from the north take SR 29 and from the south were assumed to take Silverado Trail. Evening peak hour counts recently obtained at Dunaweal Lane together with the anticipated travel pattern specific to this project were used to estimate the splits at SR 29 and Silverado Trail. The resulting trip distribution is shown in Table 5.

Table 5 – Trip Distribution Assumptions and Project-Added Trips

| Origin/Destination | Percent of Trips | Daily/Weekend Trips | PM Peak Trips | Weekend Peak Trips |
|-----------------------------------|------------------|---------------------|---------------|--------------------|
| SR 29 south of Dunaweal | | | | |
| <i>Employee Trips</i> | 0 | 0/0 | 0 | 0 |
| <i>Visitor & Truck Trips</i> | 15 | 7/7 | 2 | 4 |
| SR 29 north of Dunaweal | | | | |
| <i>Employee Trips</i> | 70 | 21/10 | 7 | 3 |
| <i>Visitor & Truck Trips</i> | 35 | 15/15 | 6 | 9 |
| Silverado Trail south of Dunaweal | | | | |
| <i>Employee Trips</i> | 0 | 0/0 | 0 | 0 |
| <i>Visitor & Truck Trips</i> | 35 | 15/15 | 6 | 9 |
| Silverado Trail north of Dunaweal | | | | |
| <i>Employee Trips</i> | 30 | 9/4 | 3 | 1 |
| <i>Visitor & Truck Trips</i> | 15 | 7/7 | 2 | 4 |
| TOTAL | | 74/58 | 26 | 30* |

Note: * Value does not equal trip generation exactly due to rounding

Plus Project Conditions

Intersections

As shown in Table 2, upon adding project-generated trips to existing volumes, both study intersections are expected to continue operating at LOS A or B overall as well as on all approaches. Because operation will remain acceptable, the impact is considered less-than-significant.

Under Future plus Project conditions both study intersections are projected to continue operating at the same levels of service both overall and on individual approaches except that the overall operation at SR 29/Dunaweal Lane changes from LOS A to LOS B. These results are shown in Table 3.

Because operation at both study intersections remains acceptable with project-generated trips added to both existing and future volumes, the project's impact on intersection operation is *less-than-significant* without any mitigation being needed.

Roadways

The cumulative impacts of all of the winery projects in the study area should be accounted for in the future traffic projections used in this analysis. These volumes reflect an 82.5 percent increase in traffic on SR 29 and more than a 200 percent increase on Silverado Trail. Given that the County is substantially more than half built out, it would appear that this magnitude of an increase is unlikely to actually be experienced, so these projections overstate the actual potential for traffic volumes to increase. It is therefore reasonable to conclude that the projected future traffic volumes include all of the trips associated with future winery development, including that which is currently envisioned and even that which is not.

As shown in Table 6, the added trips associated with the proposed project based on application of the County's standard peak hour trip assumptions result in an increase that is less than 1 percent compared to projected future volumes. The project's impact under these future, cumulative conditions is therefore considered *less-than-significant*.

| Study Segment | AM Peak Hour | | | PM Peak Hour | | |
|-----------------|----------------|-----------------|------------------|----------------|-----------------|------------------|
| | Future Volumes | Project Volumes | Percent Increase | Future Volumes | Project Volumes | Percent Increase |
| SR 29 | 2,461 | 13 | 0.53 | 2,175 | 13 | 0.60 |
| Silverado Trail | 1,175 | 6 | 0.51 | 930 | 6 | 0.65 |

Note: Future Volumes per Napa County Travel Demand Model

Transportation Demand Management Program

Although the project was determined to less-than-significant traffic impacts, to minimize the project's potential to affect traffic the project description includes transportation demand management (TDM) measures to shift project-generated trips outside the periods of peak traffic and congestion. However, even if the TDM measures failed, as noted above, the project's traffic impact would still be less-than-significant.

The traffic analysis was based on the County's standard trip generation estimates, which may overstate peak hour trips according to data collected by W-Trans. Although these added trips would be expected to have a less-than-significant impact, the proposed TDM program would reduce the number of trips added to the network below the 26 p.m. peak hour and 29 Saturday midday peak hour trips used for the analysis. The TDM program would

shift most, if not all, of these trips outside the peak hours, resulting in minimal impact during periods of peak congestion.

Production employees will work Monday through Friday from 7 a.m. to 3 p.m., hospitality and/or tasting room employees will work seven days per week from 9 a.m. to 6 p.m. The resulting weekday p.m. peak hour trips will be associated with tasting visitors only. The anticipated distribution of trips over the day, based on the planned shift patterns, is shown in Table 7, though it is noted that the trip generation used for the analysis is that shown in Table 4.

| Time of Day | Weekday | | Weekend | |
|----------------|-----------|----------|-----------|----------|
| | Employees | Visitors | Employees | Visitors |
| 6-7 AM | 3 | | | |
| 7-8 AM | | | | |
| 8-9 AM | | | 2 | |
| 9-10 AM | 8 | | 4 | |
| 10-11 AM | | 4 | | 2 |
| 11 AM -12 Noon | | 6 | | 4 |
| 12 Noon-1 PM | 8 | 10 | 2 | 8 |
| 1-2 PM | | 10 | | 12 |
| 2-3 PM | | 8 | | 12 |
| 3-4 PM | 3 | 6 | | 4 |
| 4-5 PM | | | | 2 |
| 5-6 PM | | | 2 | |
| 6-7 PM | 8 | | 4 | |
| Total | 74 | | 58 | |

Since the project will enact transportation demand management (TDM) measures to eliminate adding **any** peak hour trips, the evaluated conditions would only occur if there were employee and visitor trips as estimated without the benefit of the TDM program. Given that it is relatively easy for employee and visitor trips to be managed, as proposed, it appears reasonable to accept this TDM plan as a realistic and feasible option for addressing potential traffic impacts, even if they would be less-than-significant. Based on this analysis it was determined that **even without** the TDM program the project's trips would result in less-than-significant impacts.

Special Events

The project as proposed includes four events per year having an attendance of up to 75 people, four events with up to 200 people and one event with 500 people, or a total of nine events annually. All would be wine marketing events that would include catered food, and would occur on Saturdays or Sundays during non-peak hours. Trips that would typically be generated by a 500-person event were included on the Winery Traffic Information/Trip Generation Sheet.

It is intended that shuttles will be used during the 500-person event to transport approximately 80 percent of guests from off-site locations such as at their hotels to the winery. Event invitations will provide details about the parking and shuttle operation, and guests will be reminded to use hotel shuttles in any event-related communications. The amount of parking allowed on-site will be limited to the supply available. For a 200-person

event the parking needed would be 72 spaces for attendees and ten for employees. With 37 marked spaces plus the ability to create at least 90 informal spaces at the rear of the parcel as well as along vineyard rows, there is more than adequate space to park all of the vehicles associated with the special events having 300 attendees or less.

The maximum-sized 500-person event will occur only once per year. To avoid facilities with excessive capacities, AASHTO recommends that designs be based on volumes during the 30th highest hour. Since trips associated with the single large event per year would represent only a few of the highest hourly volumes annually, these "plus Project" conditions would not be appropriate for design purposes. Given that there is only one such event per year, analysis of conditions during the 500-person event are not warranted.

If shuttles are used in lieu of personal vehicles, even assuming use of 14-passenger vans with only 12 passengers either arriving or departing and no passengers on the return trip, then a 500-person event would generate a total of 84 round trips, or 168 trip ends, over the course of several hours. This is less than half the number of trips that would be generated by personal vehicles, and therefore shuttles would result in less of an impact than personal vehicles were used.

Other events occur on an infrequent basis (14 times per year, or less than two per month on average), so the traffic associated with them also falls below the "30th highest hour" level. Further, the TDM plan pushes these trips outside the peak hours on both weekdays and weekends, taking advantage of the excess roadway capacity available during these off-peak times rather than adding to peak period congestion.

It is noted that the special events evaluated in the traffic study are based on typical traffic associated with a maximum number of attendees, regardless of what type of event it is. Weddings were not specifically evaluated in the traffic study as they are not proposed, nor will they be allowed.

Site Access

Left-Turn Lane Warrants

The need for a left-turn lane on Dunaweal Lane at the proposed project driveway was evaluated based on criteria contained in the *Napa County Road and Street Standards*, 2011. Because future average daily traffic volumes on Dunaweal Lane are not available, recently obtained counts for both the weekday and weekend were used for this analysis.

Using the County's criteria, for the daily Friday traffic volume of 1575 vehicles and 1875 vehicles on a weekend, a left-turn lane would not be warranted for the projected driveway ADT of 74 vehicles on a weekday and 60 vehicles or more on a weekend. The proposed project would generate a weekday average of 74 trips and weekend average of 58 trips. Based on these traffic levels, a left-turn lane would not be warranted at the project driveway. The left-turn lane warrant graphs are enclosed for reference.

Sight Distance

At driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting on the driveway and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross, turn left, or turn right, without requiring the through traffic to radically alter their speed.

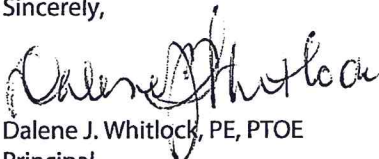
Sight distance along Dunaweal Lane at the proposed driveway was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for minor street approaches that are driveways is based on stopping sight distance, with the approach travel speeds as the basis for determining the recommended sight distance. For a 45-mph posted speed limit on Dunaweal Lane, the recommended stopping sight distance for a private driveway is 360 feet.

Dunaweal Lane is relatively flat and straight on both sides of the proposed driveway. Based on a review of the site plan, proposed driveway and Google Earth, sight lines are more than adequate and meet the recommended distance for the prevailing travel speeds.

Conclusions and Recommendations

- The proposed project would generate an average of 74 new daily trips, including 26 weekday p.m. peak hour trips and 29 weekend p.m. peak hour trips.
- The calculated collision rate for the study segment was lower than the statewide average for similar facilities.
- The study intersections and roadways are operating acceptably under existing volumes, and are expected to continue to do so with project trips added.
- Under projected future volumes the study intersections are expected to continue operating acceptably overall, though due to excessive delays anticipated at SR 29/Dunaweal Lane signalization may be warranted.
- The project trips added to SR 29 and Silverado Trail translate to less than one percent of projected Future volumes, making the impact less-than-significant.
- It is recommended that the schedule for employee shifts be set to minimize the amount of traffic generated during the weekday p.m. peak hour.
- Clear signage that directs visitors to use SR 29 when destined to the north and Silverado Trail when destined to the south should be placed at the driveway. Similar information should be provided on the winery's website as well.
- A left-turn lane is not warranted at the project driveway based on Napa County's Left-Turn Lane Warrant criterion.
- Acceptable clear sight lines are available in both directions along Dunaweal Lane from the proposed driveway.
- The applicant should take steps to minimize traffic impacts and support efforts to maintain LOS D operation on SR 29 and its intersection with Dunaweal Lane.

Sincerely,



Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/NAX077.L2



- Enclosures: Site Plan
Level of Service Calculations
Collision Rate Calculation Spreadsheet
Winery Traffic Information/Trip Generation Sheet
Napa County Left-Turn Lane Warrant