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Comments— Tentative WDRs for E. & J. Gallo Winery, Turner Roads Vintners, San Joaquin County

This letter transmits my comments on the subject tentative order issued 28 March 2024. I am a California registered civil engineer and worked for Central Valley Regional Water Quality Control Board, mostly in the WDR Program, from 1998 to 2010.

Current Order. Waste Discharge Requirements (WDRs) Order 99-103, originally for Sebastiani Vineyards, Inc., regulates the discharge of winery wastewater from two wineries, Turner Road Vintners (TRV) East and TRV West. Treatment and disposal of winery wastewater occurs in a 40-acre area at TRV West, located at 5852 West Turner Road, Lodi. Since order adoption in 1999, the two wineries changed ownership three times. In May 2021, the Central Valley Regional Board adopted Order R5-2021-0033, changing Facility ownership from Constellation Brands, Inc. to E. & J. Gallo Winery (Gallo or Discharger).
Wikipedia reports Gallo is the world' largest wine producer, makes and distributes wine under more than 100 other labels, including Turner Road Vintners, and has an annual revenue of $5.3 billion.
The current order indicates that, in 1999, discharge flow was about 170,000 gallons per day (gpd) and crush processing capacity was 30,000 tons/year. It projects the maximum anticipated processing capacity of 100,000 tons/year would generate up to 650,000 gpd of winery wastewater. It identifies the winery wastewater treatment and disposal facility at TRV West as including:
Screening to remove solids down to a particle size of 0.5 millimeters
Secondary treatment in a 5.4-acre Advanced Integrated Pond System (AIPS) comprised of four ponds equipped with a 1-foot-thick clay liner with a combined storage capacity of 15.6 million gallons (MG)

Polishing treatment, storage, and disposal in a 15-acre, 12.8-MG-capacity unlined constructed Wetlands that includes an Aerated Lake[1]
Storage and disposal in an 8-acre, 26-MG-capacity unlined Storage Lake
Irrigation of unspecified onsite landscaped areas that combined encompass 6 acres

The current order characterizes the wastewater as acidic and indicates that, prior to AIPS treatment, its pH is adjusted to neutral with ammonia (Finding 9). It claims the combined AIPS and Wetlands treatment will provide up to 97% removal of 5-day biochemical oxygen demand (BOD) and Total Suspended Solids (TSS), and generate a Wetlands effluent with BOD concentrations of 10 mg/L during average flows and 15 mg/L during peak flows (Finding 12).

The current order includes an uncited characterization of winery wastewater in the form of minimum and maximum concentrations for BOD, SS, pH, dissolved oxygen (DO), nitrate, and sulfate (Finding 12). The concentration ranges appear reasonable, except the 5.0 to 50 mg/L range cited for nitrate. Winery wastewater typically contains low concentrations of nitrate. Rather, it contains high concentrations of organic nitrogen and, to a lesser extent, ammonia, unless used for pH control. The cited range *is* reasonable for total nitrogen (i.e., organic nitrogen, ammonia, nitrite, and nitrate).

Because the current order does not identify organic nitrogen and ammonia as constituents of concern, as they eventually convert to nitrate, it does not evaluate the discharge's total loading of nitrogen to the LAA and to soils underlying the unlined Wetlands and Storage Lake. Consequently, and unfortunately, its Monitoring and Reporting Program (MRP) does not require monitoring of AIPS effluent, Wetlands effluent, and the Storage Lake for Total Kjeldahl Nitrogen (TKN, a measure of organic nitrogen and ammonia).

The current order prescribes a monthly average dry weather discharge flow limitation of 650,000 gpd (Discharge Specification B.1). However, it does not cite a water balance certified by a licensed professional demonstrating the wastewater treatment and disposal operation has sufficient disposal capacity to accommodate the maximum authorized discharge flow of 650,000 gpd.

Its regulation of the LAA discharge is limited, but does include Discharge Specification B.10: "Reclaimed wastewater used for irrigation shall be managed to minimize erosion and runoff from the disposal area." It does not specify reasonable agronomic rates for discharges to the LAAs, nor does it require monitoring and reporting of discharge flows to the LAA. However, to its credit, it does establish monthly average and daily maximum limitations (in mg/L) for Wetlands effluent discharged to the Storage Lake for BOD (40/80), total dissolved solids (TDS) (1000/1700), nitrate (10/45), and sulfate (250/500).

[1] The 15 acres cited for the Wetlands area appears to include two LAAs, a 0.3-acre island in the aeration lake and a 0.75-acre LAA along the Wetlands' eastern boundary; the area inundated by the Wetlands appears to be about 12 acres.

The current order's Finding 19 describes storm water management and disposal at both wineries. At TRV East, storm water is pumped to a disposal pond at its southern tip. At TRV West, it is either discharged to the AIPS or to the Woodbridge Irrigation District (WID) Villinger Lateral Canal "located along the southern boundary of the TRV West facility." [WID diverts water from the Mokelumne River (Lodi Lake) under pre-1914 and post-1914 appropriative rights, and provides it primarily to agricultural users within its 63-square- mile service area].

The current order requires the Discharger to monitor groundwater at TRV West, the location for wastewater treatment and disposal, and also at TRV East, where an underground storage tank (UST) investigation revealed elevated nitrate in groundwater. Its MRP requires groundwater be monitored quarterly for nitrate as nitrogen, TDS, Specific Conductivity (EC), and pH; and semi-annually for Standard Minerals (Calcium, Magnesium, Sodium, Chloride, Nitrate, Sulfate, TDS, Total Alkalinity (including alkalinity series), and Hardness.

***Tentative Order*.** The Discharger purchased TRV East and TRV West (Facilities) in 2021 and, in 2023, submitted a Report of Waste Discharge (RWD) describing current Facilities processing capacity and wastewater discharges to land (Findings 2 and 3). The Facilities currently crush up to 120,000 tons/year, and also receive grape juice and finished wine (Finding 9). The current crush capacity is 20% greater than the current order's projection of maximum capacity. From 2019 through 2022, maximum discharge flows ranged from about 175,000 to 330,000 gpd and annual discharge flows ranged from 25.2 MG in 2020 to
45.9 MG in 2022 (Finding 15). As such, even though processing capacity has increased, wastewater discharge flows have not approached the current order's maximum projected 650,000 gpd.
Finding 20 describes the Wetland's functions as including "polishing" treatment and storage; the current order includes effluent disposal as a Wetlands function. Detention times for "polishing treatment" of winery wastewater in constructed wetlands varies, but is typically about a week, according to *Comprehensive Guide to Sustainable Management of Winery Water and Associated Energy,* prepared in 2009 for Wine Institute by Kennedy/Jenks Consultants, Inc. (2009 Guide). The 12.8 MG-capacity Wetlands provides about 40 days detention at a maximum flow of about 330,000 gpd (Finding 15), and
20 days at the maximum permitted discharge flow of 650,000 gpd. Detention times during non-crush periods are much longer. Additional BOD removal treatment, or polishing, provided by the Wetlands is negligible compared to the impressive BOD removal provided by AIPS treatment. In fact, the BOD concentration of AIPS effluent is sufficiently low for direct sprinkler discharge to LAA landscaping. Because the Wetlands provide longer detention time than the design criteria for polishing treatment, its main function appears to be effluent disposal. The Wetlands, it appears, are essentially unlined effluent disposal ponds with bullrushes and cattails.

Recommendation. Please revise Finding 20 to include effluent disposal as a Wetlands function, as was done in the current order.

Finding 25 identifies the area encompassed by the three LAAs depicted on Attachment B as 12 acres; however, the area is more like 7 acres. The finding does not attribute the RWD as the source for cited acreage, so it is unknown whether the RWD's water balances used the correct area. Like the current order, the tentative order does not describe landscaping vegetation or characterize its annual water and nitrogen demands.

Recommendation: Please revise the tentative order to correct the acreage cited in Finding 25 for the Discharger's available LAA and cite the LAA acreage used in the RWD's water balances in Finding 30. Also, describe LAA landscaping (e.g., mature deciduous trees, grasses), estimate its annual demands for water (ft/year) and nitrogen (lbs/acre/year), and describe the type and spacing of sprinklers installed in each of the three LAAs.

The tentative order proposes to prescribe two discharge flow limitations: Monthly Average Daily Flow of 0.650 million gallons per day (MGD) and Total Annual Flow of 86 MG (Flow Limitations C.1). Recent years' daily discharge flows are less than 50% of the proposed 0.650-MGD Monthly Average Daily Flow limit. The 86-MG Total Annual Flow limit is 2 to 3 times that of recent years' total annual flow. With the exception of minor facility changes (Findings 32 and 33), the tentative order does not describe Discharger plans to further increase crush capacity and/or to expand non-crush operations (e.g., bottling). The tentative order attributes the 86-MG annual limit on the RWD's water balances that included the AIPS, Wetlands, Storage Lake, LAAs, and WID water (more on this later).

Recommendation: Please revise the tentative order to explain why the Regional Board should authorize wastewater discharge flows that are substantially greater than current flow conditions, especially since the Discharger does not propose any significant increase in processing capacity. Consider revising Flow Limitations C.1 to prescribe a Monthly Average Daily Flow of 0.50 MGD and (b) Total Annual Discharge Flow of 70 MG. These values represent a 50% increase over current flow conditions and should be more than adequate to provide the Discharger with operational flexibility.

The tentative order does not disclose the hydraulic loading to groundwater represented by current discharge flows, or at the proposed 86-MG Total Annual Flow limit. It does not disclose the estimated seepage rate (e.g., inches/day or gallons per day per acre) from AIPS ponds (more on this later) or from the unlined Wetlands and Storage Lake. It does not identify the RWD's values for percolation losses from the Wetlands and Storage Lake and leaching fraction losses from the LAA for average and 100-year water balances. This information is necessary for the tentative order to characterize the annual amount of wastewater discharged to groundwater as percolation and leaching fraction losses at current and maximum permitted discharge flows.

Recommendation: Revise the tentative order to include estimates from the RWD's average and 100-year water balances of percolation losses from the Wetlands and Storage Lake and leaching fraction losses from the LAA.
Please do not respond by indicating the requested estimates for the discharge's hydraulic loading to groundwater are included in the RWD, a public document available for inspection by downloading the file from a Regional Board office's public access computer. It should go without saying, but apparently this needs to be repeated: disclosures of the hydraulic loading to groundwater from discharges of waste regulated under the Non-15 Program are required to document the discharge's potential to impact groundwater.

In this discharge situation, the percolation capacity of the Wetlands and Storage Lake may decrease during periods of high groundwater conditions. The State Water Resources Control Board's General Winery Order (WQ 2021-0002-DWQ) requires the base of winery wastewater ponds to be at least 5 feet above the "seasonal high water table," or a minimum of 2 feet if compliance with the 5-foot distance is not feasible and "site-specific conditions indicate the smaller separation will not pose a threat to water quality; technical justification shall be provided by the Discharger."

Groundwater elevations are as high as 6 feet below ground surface (bgs) at TRV West (Finding 41). Each AIPS pond is 12 feet deep (Finding 16); the Wetlands' Bullrush Wetland and Aeration Lake are 8- to 10-feet deep and its Cattail Wetland is 2-feet deep (Finding 21); and, the Storage Lake is 10-feet deep (current order Finding 15). The tentative order does not disclose the vertical separation distances between the base of these features and highest anticipated groundwater.
Recommendation: Please revise the tentative order to disclose the base elevations of AIPS ponds, Wetlands (its Bullrush and Cattail segments and its Aerated Lake), and Storage Lake, and the vertical separation distances between these base elevations and highest anticipated groundwater elevation. If separation distances are less than 5 feet, provide technical justification that a smaller separation will not pose a threat to water quality.

Unreasonable use of WID Water. The tentative order's Attachment D, Wastewater Flow Schematic, depicts the flow of WID water to AIPS Pond 4 and to the Storage Lake. The current order does disclose the use of WID water for any purpose, including LAA irrigation. The tentative order's Finding 16 states, "When the AIPS ponds are in need of additional aeration to correct low dissolved oxygen concentrations, [WID] water can be discharged into Pond 4 or Pond 3 to provide an oxygen supply." Finding 23 indicates WID water is "routinely added to [the Storage Lake] during the summer months to maintain adequate water levels to support irrigation needs." The tentative order does not characterize the frequency, duration, and volume of WID water discharges to AIPS ponds and to the Storage Lake, or disclose when this practice was initiated.
Assuming the irrigation demand of LAA landscaping is 5 ft/year, or an annual 35 acre-feet or 11.4 MG for the 7-acre LAA. This demand is less than 50% of current total annual

discharge flows. Averaged over an irrigation season of 200 days (April to October), the 11.4-MG annual demand requires a daily effluent supply of about 30,000 gpd. Current discharge flows and the 26-MG-capacity Storage Lake appear more than adequate to meet LAA water demand without the use of WID water. The tentative order does not explain why WID water is required when existing discharge flows and storage capacity appear more than adequate to meet the 7-acre LAA's summer-time irrigation demand.

Due to its origins in the Mokelumne River watershed, WID water is of exceptionally high quality, as characterized in Finding 17 (e.g., TDS of 32.5 mg/L and chloride of 1.1 mg/L). Finding 26 characterizes the TDS of AIPS and Wetlands effluents as about 500 mg/L, and the Storage Lake TDS as about 240 mg/L The amount of WID water routinely discharged to the Storage Lake is apparently sufficient to dilute the TDS of Wetlands effluent by 50%. The tentative order explains routine WID water discharges to the Storage Lake are necessary "to maintain adequate water levels to support irrigation needs." Google Earth imagery consistently shows the Storage Lake full. Perhaps WID water is discharged to the Storage Lake to keep it full, and not because the water is needed for LAA irrigation.

Question: Please explain why WID water is discharged to the Storage Lake when existing effluent discharge flows and Storage Lake capacity are more than adequate to meet LAA water demand. Is the justification for routine WID water discharges simply to keep the Storage Lake at a certain water depth. If so, why? Explain the "irrigation needs" used to justify this dilution practice.

Diluting Wetlands effluent in the Storage Lake with high-quality surface water results in groundwater recharged by Storage Lake seepage containing lower salinity than groundwater recharged by Wetlands seepage and LAA leaching losses. Most dischargers with disposal pond operations subject to salinity limitations for effluent and/or groundwater would likely welcome a dilution supply of low salinity surface water, especially from providers like WID with pre-1914 appropriate rights. Granted, where the LAA acreage and crop water demand cannot be met by effluent flow alone, it may be reasonable to allow the blending in a storage pond secondary-treated winery wastewater and supplemental irrigation water (surface or groundwater). However, this is not the case. Therefore, there appears no need for routine discharges of WID water to the Storage Lake to "support irrigation needs."

The tentative order describes the wildlife habitat provided of the Wetlands and Storage Lake (Finding 27). While impressive, it does not mention recognition by a wildlife regulatory agency (e.g., California Department of Fish and Wildlife) identifying the habitat as regionally important and recommending specific management practices (e.g., maintaining Storage Lake water levels). The Wetlands provide negligible BOD removal treatment. Its longer-than-necessary detention time suggests its primary function is effluent disposal by uptake by aquatic plants, water surface evaporation, and percolation to groundwater. The Storage Lake provides over twice the required capacity to meet annual LAA water demand. Consequently, disposal of effluent (and WID water) discharged to the Storage Lake in excess of LAA irrigation demand occurs through water surface evaporation

and percolation. Because the Wetlands and Storage Lake are not equipped with a liner, the sustainability of their continued use will depend, in part, on the results of future groundwater monitoring for an expanded suite of constituents, including dissolved forms of iron, manganese, and arsenic.

As mentioned earlier, the current order does not disclose the use of WID water for increasing the DO concentration of wastewater undergoing AIPS treatment. The tentative order does not opine on the reasonableness of this practice, particularly if it is done to comply with the pond DO limit. Because there are many practicable alternatives for complying with the pond DO limit, the cost savings realized by not having to increase AIPS aeration capacity gives Gallo an unfair competitive advantage. Recall that Gallo is the largest wine company in the world. It can afford to install the necessary AIPS aeration capacity to comply with the pond DO limit. The Basin Plan does not designate a beneficial use of surface water for wastewater treatment. The use of WID water in AIPS treatment is an unreasonable use of water that should be prevented pursuant to the California Constitution, Article X, Section 2. Consider possible outcomes if the Regional Board were to find reasonable the described use of WID water in AIPS treatment. Other dischargers with access to surface water may request authorization to dilute their wastewaters to meet discharge requirements, thereby realizing cost savings that create an unfair playing field.
Recommendation: Revise the tentative order to characterize the frequency, duration, and volume of WID water discharges to AIPS ponds and the Storage Lake, and to disclose when this practice began. Explain why this practice does not constituent a violation of the current order's Discharge Prohibition A.5, as well as the MRP requirement for effluent samples to "be representative of the volume and nature of the discharge." Also explain why this practice does not represent an unreasonable use of water that should be prevented pursuant to California Constitution Article X Section 2.

Because there are alternatives for increasing the DO concentration in AIPS ponds without the addition of WID water and since there is no apparent need for WID water for LAA irrigation, please revise the tentative order to prohibit the discharge of WID water to wastewater undergoing treatment and or to the Storage Lake.

*If, on the other hand, staff can provide a plausible technical **and** regulatory justification for the use of WID water in AIPS treatment and/or for LAA irrigation, please revise the MRP to establish an additional sample location, S4, to monitor WID water flow to AIPS ponds and to the Storage Lake, and to require continuous monitoring of WID flow by meter and quarterly reporting of calculated total daily flows.*

Use of Ammonia for pH Control. The current order indicates that ammonia is added to winery wastewater to adjust to neutral pH prior to AIPS treatment. The tentative order does not characterize winery wastewater for pH before, during, and after treatment, even though the current order's MRP requires pH monitoring of AIPS effluent, Constructed Wetlands, and Storage Lake. It does not mention the use of ammonia to neutralize acidic wastewater prior to AIPS treatment, nor is this depicted on the flow schematic

(Attachment C). Ammonia *is* mentioned as a chemical used in the Facilities (Finding 12), but only for closed-circuit refrigeration.

Question: Does the Discharger still add ammonia to raise winery wastewater pH prior to AIPS treatment? If so, how much? If not, explain why proper AIPS treatment is not adversely impacted by the acidity of winery wastewater.
Recommendation: Please revise the tentative order to include a finding mentioning the previous use of ammonia to raise wastewater pH prior to AIPS treatment, to disclose if this practice continues, and, if not, when it ended. If ammonia is no longer added for pH control, explain why it is no longer deemed necessary for proper AIPS treatment when it was at the time of order adoption.

If this practice does continue, include a finding identifying the amount of ammonia used annually for this purpose; revise the wastewater flow schematic accordingly; revise Finding 68.c to disclose ammonia usage in its evaluation of discharge impacts from nitrate as nitrogen; and, revise MRP Table 4 to include ammonia as nitrogen and organic nitrogen in the suite of constituents monitored at S1, S2, and S3.

Incomplete Characterization of Discharge Nitrogen Impacts. The tentative order's characterization of the nitrogen in AIPS effluent (Finding 18), Wetland effluent (Finding 22), and the Storage Lake (Finding 24) is limited to nitrate, which, on average, is typically less than 1 mg/L as nitrogen. The current MRP does not require monitoring for ammonia, despite its use for pH control, and for TKN (or for total nitrogen). The update of the current order was identified as pending, not yet scheduled, in the June 2022 Executive Officer's Report. It is unfortunate that staff did not request the Discharger to perform additional monitoring for TKN and ammonia. In the absence of this data, the tentative order does not provide an adequate characterization of the discharge for nitrogen.
Consequently, its evaluation of the discharge's potential to impact groundwater for nitrate is flawed as it does not consider discharge concentrations of organic nitrogen and ammonia, which eventually convert to nitrate.

The Discharger's 2023 RWD should, however, contain results of sampling conducted by the Discharger for the RWD to include "a COMPLETE characterization of the discharge."[2] The tentative order does not identify the licensed professionals who prepared the Discharger's 2023, but attributes Kennedy Jenks (Kennedy/Jenks Consultants, Inc.) as the source for the wastewater flow schematic in Attachment D. If the RWD was prepared by licensed professionals affiliated with Kennedy/Jenks Consultants, then the RWD should have included a characterization of the discharge for TKN and ammonia (i.e., concentrations of both in AIPS effluent, Wetlands effluent, and the Storage Lake) based on limited sampling results or data from comparable wineries.

[2] Form 200, APPLICATION/REPORT OF WASTE DISCHARGE, VI. OTHER REQUIRED INFORMATION

Finding 30 states, "nutrient loadings show that nitrogen from water in the Storage Lake is significantly lower than landscaping needs, and additional fertilizer may be needed." The nitrogen loadings *would* be low if they were determined solely on the low concentrations of nitrate in the Wetlands effluent. Nitrate concentrations are even lower in Storage Lake effluent because it receives routine discharges of WID water.

Recommendation: The RWD's discharge characterization should have included TKN and ammonia, especially if ammonia is still used for pH control. And, it should have cited value(s) for discharge total nitrogen used to characterize annual LAA nitrogen loading rates. Accordingly, please revise the tentative order to include this information and, if it is not in the RWD, cite reasonable ranges for total nitrogen in winery wastewater from comparable wineries with winery wastewater treatment (e.g., nearby Sutter Home Winery West Facility regulated by WDRs Order R5-2015-0085). Then, update its evaluation of the discharge's potential to impact groundwater from total nitrogen in the seepage discharge from the Wetlands and Storage Lake, and re-evaluate the accuracy of Finding 30's last sentence.

Finding 26 compares the quality of effluent from the AIPS, Wetlands, and Storage Lake for salinity (EC and TDS), BOD, and nitrate. The TDS concentration in AIPS and Wetlands effluents is about 500 mg/L, while in the Storage Lake it is lower by 50% (240 mg/L). It indicates the salinity (EC and TDS), BOD, and nitrate concentrations in the discharge "are less than average concentrations associated with other wineries, based on [the General Winery Order's Table 2]."

The State General Winery Order establishes a tiered regulatory approach to authorize Facility process water flows of up to 15 MG/yr. Its Table 2 presents a characterization of winery wastewater attributed to the 2009 Guide. This reference states, "Statistics for each parameter were calculated based on a relatively small number of samples, thus they are not necessarily representative of conditions at other facilities; the table is provided for illustration purposes only. When interpreting data, it is important to consider constituent loadings (constituent concentrations times the volume of the discharge), rather than concentration alone." In any event, Table 2 shows total nitrogen as ranging from 5 to
430 mg/L and averaging 78 mg/L.

AIPS Ponds Clay Liner. The tentative order does not describe the results of AIPS ponds liner performance tests conducted by the Discharger to estimate its hydraulic conductivity and demonstrate it is operating with minimal leaking. Its MRP does not require annual reports to contain results of AIPS liner performance undertaken during the reporting year, and descriptions of needed modifications.

The General Winery Order requires new or expanding ponds meet a hydraulic conductivity standard of $1x10^{-6}$ centimeter per sec (cm/s), and cites acceptable designs as including a "compacted clay liner, with a minimum clay thickness of two feet" (D.2.b.ii). It requires dischargers with existing ponds to "[d]emonstrate using a performance test (e.g., seepage/leak test, water balance, liner leak detection testing, or geologic evaluation) that the existing pond is operating with minimal leaking and meets the hydraulic conductivity

standard, [and] describe the performance test methodology, pond liner characteristics and conditions, visual observations, test results and conclusions, and if liner modifications or repairs are needed to continue pond operations (D.2.c.ii.b.2).
Its MRP requires annual reports to contain results of any pond liner performance evaluation undertaken during the reporting year, including "a description of the pond liner integrity and leak detection tests and results, and a discussion of the pond liner performance" (MRP D. Annual Reports, Pond Reporting 11) and a "description of any liner maintenance, repairs, or modifications needed to maintain pond performance and provide an implementation schedule." (MRP D. Annual Reports, Compliance Summary 36).

Recommendation: Please revise the tentative order to describe efforts by the Discharger to estimate the current hydraulic conductivity of the AIPS ponds' clay liner, now 25 years old. Revise the MRP to require annual reports to contain the results of any pond liner performance evaluation undertaken during the reporting year comparable to that required by the General Winery Order's MRP. And, include a new provision requiring the Discharger to submit within one year of order adoption, a technical report describing the results of a liner performance test (e.g., seepage/leak test, water balance, liner leak detection testing, or geologic evaluation). The technical report should estimate the liners' hydraulic conductivity and demonstrate that they are operating with minimal leaking. If liner modifications or repairs are needed to continue AIPS operation, the technical report should propose repairs or replacement and an implementation schedule not to exceed three years.
Site-Specific Conditions. The tentative order characterizes area land uses as mainly agricultural. From Google Earth, it appears that at least seven residences are within 1,000 feet of the wastewater treatment and disposal operation. Also, 1.5 miles northwest is Sutter Home Winery's West Facility and its HDPE-lined winery wastewater treatment ponds and 268 acres of LAAs.

Recommendation: Revise Finding 35 to include rural residential as an area land use, identify the approximate number of residences with 1,000 feet of wastewater treatment and disposal operations, and disclose the proximity of the winery wastewater treatment and disposal operation at Sutter Home Winery West Facility 1.5 miles northwest.

The current order indicates surface water drainage in the discharge vicinity is to Sycamore Slough, tributary to South Fork Mokelumne River (Finding 25), and WID's Villinger Lateral Canal is located along TRV West's southern border. From Google Earth, the canal is about 30 feet wide and is intersected at TRV West's southwestern corner by a smaller canal, about 6-feet wide, located along TRV West's western border. Both canals appear to be unlined. Canal seepage of high-quality surface water may cause localized groundwater mounding and, when adjacent to wastewater treatment and disposal ponds, can complicate efforts to interpret groundwater gradient and quality data.
Recommendation: Revise Finding 36 to include the current order's description of surface water drainage (Finding 25); disclose the presence of irrigation delivery canals along TRV

West's southern and western boundaries; describe their containment, if any, and seasonality of use; and disclose canal seepage, particularly in the vicinity of two monitoring wells (MW-1 and MW-2), can complicate the interpretation of groundwater gradient and quality data.
Finding 37 indicates soils at TRV West are primarily Acampo Sandy Loam, but does not provide relevant characterizations of runoff and permeability. Acampo Sandy Loam soils are characterized as moderately well drained with slow runoff and moderately rapid permeability.[3]

Recommendation: Revise Finding 37 to describe the runoff and permeability characteristics of Acampo Sandy Loam soils.

Groundwater Conditions. The tentative order does not characterize regional groundwater conditions or disclose the discharge's location in the groundwater subbasin monitored by the Eastern San Joaquin Groundwater Authority. This information is included in WDR Order R5-2015-0085 for Sutter Home Winery West Facility, Findings 46 through 49:
Lodi is located within the Eastern San Joaquin Subbasin of the San Joaquin River Groundwater Basin, San Joaquin River Hydrologic Region. Water-bearing units of the subbasin include undifferentiated deposits of alluvium and flood basin deposits of the Laguna Formation. The Plio-Pleistocene Laguna Formation consists of discontinuous lenses of fluvial sand and silt with lesser amounts of clay and gravel.

Shallow groundwater in the Lodi area occurs within the alluvial flood plain deposits to depths of greater than 20 feet bgs. The depth to groundwater is as little as a few feet below ground surface in some areas, especially near unlined canals and surface water bodies such as Sycamore Slough.

The Eastern San Joaquin Groundwater Basin Groundwater Management Plan1 summarizes the geologic and hydrogeologic conditions in the Eastern San Joaquin, Cosumnes, and Tracy Sub-basins of the greater San Joaquin Valley Groundwater Basin. According to the Plan, degradation of water quality due to TDS and/or chloride contamination threatens the long-term sustainability of groundwater as a water resource for drinking water needs and irrigating crops. Regional sources of groundwater degradation include applied fertilizers, salts, and septic systems (nitrate and salt loading).
Shallow groundwater depth and flow conditions can vary depending on location, season, land use, nearby pumping (i.e., construction dewatering, agricultural wells and irrigation, etc.), and the proximity and flow stage of nearby surface water bodies. As a result, changes in agricultural land use, irrigation practices, and regional pumping have likely altered the groundwater flow regime. The local topography and low horizontal gradient suggest a low net horizontal movement of shallow groundwater.

[3] https://soilseries.sc.egov.usda.gov/OSD_Docs/A/ACAMPO.html

Recommendation: Please revise the tentative order to include the above in its findings on Groundwater Conditions.

The Discharger's current groundwater monitoring well network is comprised of five wells (MW-1 through MW-5), of which all but MW-3 are installed at TRV West. The current order mentions data from monitoring wells installed at TRV East as part of an UST investigation indicated groundwater flow direction was west to northwest (Finding 22). The installation of MW-3 appears to have been prompted to investigate elevated nitrate concentrations in groundwater passing through the UST investigation's monitoring wells. The tentative order does not mention this, but should.

MW-1 and MW-2 are located along TRV West's western boundary, and within 50 feet of the irrigation canal mentioned earlier. MW-1 is close to the NW corner of the westernmost AIPS pond, MW-2 is near the Storage Lake, MW-5 is close the to the SE corner of the easternmost AIPS pond, and MW-4 is along the eastern border of the largest LAA, north of the Storage Lake and Wetlands. The Discharger's RWD and groundwater monitoring reports designate wells as upgradient (MW-1 and MW-2), downgradient (MW-3), and cross/downgradient (MW-4) (Finding 40). Finding 41 provides minimum and maximum values for groundwater depth (and elevation) from 2019 through first quarter 2023. The highest groundwater elevations were recorded in MW-1 and MW-2. Table 9 indicates that the minimum depth to groundwater was about
6.5 feet in MW-1 and MW-2, and 8 feet in MW-4 and MW-5. Finding 42 states, "Horizontal groundwater flow direction is generally to the southeast but has varied between northeast and southeast." Attachment C depicts the general groundwater flow direction as east- southeast.

Information about groundwater conditions in the discharge vicinity is contained in groundwater reports published by San Joaquin County Flood Control and Water Conservation District.
Also, SGMA Data Viewer displays contour maps of Spring and Fall groundwater depth and elevation from 2011 to 2023. In most contour views (e.g., Spring 2021), the discharge vicinity is not bracketed by contour lines; however, views can display elevation or depth data for nearby individual wells. In views depicting contours near the discharge vicinity, the regional groundwater gradient is relatively flat, and direction fluctuates, but is mostly westerly, towards the Delta, opposite of that indicated in Attachment C. SGMA views of groundwater depth contours show the discharge site as west of the 40-ft depth contour from Spring 2019 through Spring 2023. In many views, the 20-ft contour line is missing west of the discharge site. However, the 20-ft depth contour line does close in Spring 2022, and is about 4 miles west of the discharge site. It appears, then, that the discharge has caused groundwater to mound above regional elevations under the Storage Lake and Wetlands, thus creating an apparent false impression that regional groundwater flow is east-southeast.

The tentative order does not consider if groundwater is mounding under the Storage Lake and, perhaps to a lesser degree, under the Wetlands. Monitoring wells located along the flanks of a groundwater mound created by a pond discharge are all downgradient wells.
The elevation of groundwater passing through MW-3, located about 4,000 feet east of TRV West, may at times be lower than MW-1 and MW-2. Because regional groundwater flow appears to be westerly, MW-3 may actually reflect regional groundwater uninfluenced by the discharge (i.e., it can be considered an upgradient well). Data characterizing groundwater for hardness and alkalinity may show the extent to which groundwater flowing through monitoring wells is impacted by organic loading caused by the discharge. Low nitrate concentrations in groundwater passing through MW-1, MW-2, and MW-5 may signal organic loading caused by the discharge. Evidence confirming organic overloading can also be revealed by quarterly monitoring of groundwater for additional constituents, including total organic carbon (TOC) and dissolved forms of iron, manganese, and arsenic.

Finding 69 opines, "The dissolution of metals to an extent that it poses a threat to the beneficial uses of groundwater is not likely occurring." It bases this opinion on the relatively low BOD concentration in AIPS and Wetlands effluents compared to untreated winery wastewater. However, Regional Board case files are replete with groundwater monitoring data showing mobilization of iron, manganese, and arsenic in groundwater caused by the seepage of secondary-treated municipal wastewater from unlined ponds. The opinion, therefore, appears unfounded.
Recommendation: Please revise the tentative order to include one or more findings characterizing regional groundwater conditions (flow and quality), in a manner comparable to other WDRs (e.g., Sutter Home Winery West Facility). And, mention the discharge is in the groundwater subbasin monitored by the Eastern San Joaquin Groundwater Authority. Also, include in Table 10's characterization of groundwater average and maximum values for hardness and alkalinity, as well as for chloride (a useful discharge tracer constituent).

And, revise MRP Table 5 to increase monitoring frequency of all constituents to quarterly in order to provide sufficient data in a reasonable amount of time to allow for proper characterization of groundwater. And, include quarterly monitoring for dissolved arsenic, TOC, and, since the winery wastewater is acidic, include annual monitoring for metals (total and dissolved forms of chromium, copper, lead, and nickel) to evaluate the extent to which acidic wastewater is leaching metals from metallic drains, pipes, tanks, etc.
The tentative order incorrectly indicates that its effluent limitation for BOD is "the same limit required by [the current order]." The current order establishes two BOD limitations for Wetlands effluent: 80 mg/L daily maximum and 40 mg/L monthly average. In contrast, the tentative order proposes a relaxed annual average flow-weighted effluent limit of
60 mg/L (Table 14). An effluent limitation of 750 mg/L for annual flow-weighted TDS may be reasonable in light of the Regional Board's long-term salinity control efforts. However, it is not appropriate to use an annual average for determining compliance with a performance-based effluent BOD limit. Recall that the current order claimed the BOD of Wetlands effluent would be 15 mg/L during crush, and 10 mg/L the remainder of the year.

To ensure proper AIPS and Wetlands BOD removal treatment, and to reflect the implementation of best practical treatment or control, it is appropriate for the tentative order to carry over the current order's 40/80 effluent limits for BOD, especially as the primary method of effluent disposal is via percolation. Monitoring data presented in Finding 26, Table 7, shows an average Wetland effluent BOD of 24 mg/L, below the current order's 40 mg/L monthly average limit.

Recommendation: Revise D. Performance Based Effluent Limitations to carry over the current order's Wetlands effluent BOD limitations of 40 mg/L monthly average and 80 mg/L daily maximum. Recognize that discharge quality is necessary to reduce the threat to groundwater posed by the percolation discharge, as pond disposal operations typically do not include the drying intervals required for soil treatment for BOD and nitrogen removal.

The tentative order requires weekly monitoring of all ponds for DO, but does not specify monitoring to be performed in the morning hours when DO concentrations are lowest due to nocturnal algae respiration. Without specifying monitoring to occur in the morning, the resulting data may be of limited use for assessing compliance with Discharge Specification E.4. The requirement for morning pond DO monitoring is contained in many WDRs for pond discharges and, as such, should not pose an undue burden on the Discharger.
Recommendation: Please amend the pond monitoring requirements to specify dissolved oxygen monitoring to be performed between the hours of 8:00 a.m. and 10:00 a.m.

Thank you for your time and consideration.

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