CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO.

WASTE DISCHARGE REQUIREMENTS
FOR
BARREL TEN QUARTER CIRCLE LAND COMPANY
BARREL TEN QUARTER CIRCLE, ESCALON CELLARS
SAN JOAQUIN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Water Board) finds that:

1. Barrel Ten Quarter Circle, Escalon Cellars (hereafter Discharger) submitted a Report of Waste Discharge (RWD) dated 28 January 2005 for treatment and land application of wastewater generated at its wine processing and storage facility. The Discharger submitted RWD amendments on 19 September 2005 and 26 May 2006; additional information was also submitted on 25 April 2007, 30 May 2007, and a third RWD Amendment was submitted on 10 November 2008.

2. Order No. 91-223, adopted by the Regional Water Board on 26 November 1991, prescribes requirements for the Discharger's winery. This Order is neither adequate nor consistent with the current plans and policies of the Regional Water Board, nor with the Discharger's current operational plans.

3. Cease and Desist Order (CDO) No. R5-2003-0012 was adopted on 1 January 2003 in response to groundwater quality degradation beneath the Land Application Areas (LAAs) when the previous owner (Canandaigua) operated the facility. CDO No. R5-2003-0012 was rescinded and replaced by CDO No. R5-2003-0125, adopted on 5 September 2003 after the Discharger purchased the facility.

4. The winery is at 21801 Highway 120, Escalon, San Joaquin County. The winery and associated LAAs comprise approximately 128 acres (Assessor's Parcel No. 205-250-02) in Section 36, T1S, R8E, MDB&M. The facility location is shown on Attachment A, which is attached hereto and is made part of this Order by reference.

5. The Discharger has owned and operated the winery facility and LAAs since July 2003 and states the winery has existed since at least the 1890's; prior owners and operators include Canandaigua, Heublein Wine, Erly Industries, United Vintners, Allied Grape Growers, Italian Swiss Colony, Petri, and the Stockton Fruit and Grape Company.

6. The Discharger is proposing to make future modifications to the winery that will change the quality and quantity of the wastewater discharged to land. The changes include improvements to the equipment used to produce wine, source control to reduce waste constituent loadings to land, but also includes a reduction in the available LAA acreage. This WDR includes a schedule for completion of technical reports and improvements to the facility.

BACKGROUND

7. Historically, the previous operators of the facility crushed grapes, fermented wine, distilled spirits, and bottled products. As of 2001 distilling was discontinued, and crushing grapes was discontinued in 2003. Since then the facility has been operated as a finishing and storage facility. No distilling, crushing, fermenting, bottling or packaging of wine is performed at the facility. However, the Discharger has decided to resume grape crushing and fermenting as of 2010. The Discharger is not proposing to resume distilling or bottling activities.

8. Activities at the site while operated by the previous owners included the following:

   a. Grapes were crushed to produce wine. The maximum crush capacity of the facility was 100,000 tons of grapes.

   b. A distillery was operated. In 2001, 1.08 million gallons (Mgal) of wine were distilled; in 2000, 1.88 Mgal of wine were distilled. Stillage (the residual wine after the alcohol is distilled from it) was mixed with winery wastewater and applied to the LAAs.

   c. Wastewater was generated by the wine making process. Stormwater runoff, excluding parking lot runoff, was directed into the wastewater system and discharged to the LAAs.

   d. Wastewater flow rates were highest during and after the crush season (August through December).

   e. Wastewater discharges at the facility were directed to individual land application areas based on the type of wastewater. The LAAs are identified on Attachment B, which is attached and made part of this Order by reference. In general, winery wastewater was applied to LAAs 1 - 5, while non-contact cooling water was applied to LAAs 6 and 7.

Land Area	Land Use	Acres	Historic/Present Use
Basin No. 1	Land Application	15	Historic Use
Basin No. 2	Land Application	19	Historic Use
Basin No. 3	Land Application	16	Historic Use
Basin No. 4	Land Application	10	Historic Use
Basin No. 5	Land Application	18	Historic Use
Basin No. 6	Land Application	3.0	Historic Use
Basin No. 7	Land Application	7.0	Historic Use
Tailwater Basin	Tailwater/Irrigation Water Storage	8.3	Present Use
Stormwater Basin	Stormwater Storage	0.65	Present Use
LAA No. 1N	Land Application	10	Present Use
LAA No. 1S	Land Application	48	Present Use
LAA No. 2	Land Application	6.0	Present Use
LAA No.3	Land Application	3.5	Present Use
LAA No. 4	Land Application	2.0	Present Use

9. The previous operators used a variety of chemicals as cleaners or sanitizers; chemicals are also used in wine preservation and boiler or cooling tower water treatment. These compounds included the following:

Chemical	Use	Est. Quantity/year
Ammonium Hydroxide	Sulfuric Acid Neutralizer	49.1 tons
Sulfuric Acid (93%)	Ion Exchange Regeneration	15,400 gallons
Sodium Hydroxide	Sanitation	3,450 gallons
Sodium Hypochlorite (12.5%)	Sanitation	13,100 gallons
Citric Acid	Sanitation	4,200 pounds
Sodium Carbonate	Sanitation	30,800 pounds
Trisodium Phosphate	Sanitation	13,100 pounds
Sulfur Dioxide	Sanitation and Preservative	28.2 tons
Sodium Chloride	Ion Exchange Regeneration	29,400 pounds
Sodium Hydroxide	Boiler Water Treatment	1,410 pounds
Colloidal	Boiler Water Treatment	2,820 pounds
Sulfuric Acid (<51%)	Cooling Tower Treatment	385 gallons

FACILITY CHANGES

10. The Discharger plans to begin crushing operations at the facility in 2010. As part of the crushing operation, grapes will be crushed, fermented, pressed and filtered, stabilized, and will be hauled to other facilities for bottling. Wine from other facilities will be transported to the facility for finishing, stabilization, and storage.

11. The long range plan for the facility is to process 125,000 tons of grapes on-site by adding crushing and fermentation capabilities to current operations. Crushing will increase by 25,000 tons per year for the next five years. However, business and market conditions may modify that forecast.

12. In order to accommodate the crush activities, the facility will construct a new crush pad, install a destemmer and stem collection pit, construct 5 to 10 red wine fermentation tanks, install 2 to 4 presses, add associated clarification and filtration equipment, install permanent and portable refrigeration equipment, prepare a grape truck staging area, and construct a grape test stand. In following years, additional equipment will be added to accommodate the increase tonnage of grapes crushed.

13. The Discharger will use rotary vacuum filters and pressure leaf filters for filtering. The filters will be rinsed with water after each fining/filtering event. Spent diatomaceous earth and pomace will be stored and allowed to drain free liquids on a concrete pad (Pomace/DE Pad) equipped with a sump to return liquids that drain to the wastewater system. The location of the Pomace/DE Pad is presented on Attachment B.

14. Since purchasing the facility the Discharger has made changes to the wine storage tanks. To date, 32 concrete tanks providing 1.3 Mgal of wine storage, and 86 redwood tanks providing 3.0 Mgal of wine storage have been removed from service. A summary of wine storage tank status is provided below, including tanks planned for future installation.

Status	Storage (Mgal)	Material	Number of Tanks
Removed	1.3	Concrete	32
Removed	3.0	Redwood	86
Existing	37	Stainless Steel	152
Planned	23	Stainless Steel	104
Total at Build Out	60		256

15. To allow equalization of wastewater constituent concentrations and application rate, the Discharger has constructed or implemented the following:

    a. A concrete pad for storage of pomace and spent diatomaceous earth prior to offsite disposal. The concrete pad drains to a sump where particulate matter is settled and the liquid is gravity fed to the wastewater system.

    b. A process water blending and storage system to allow high strength process water to commingle with lower strength process water for a more consistent process water quality that is discharged to the LAA.

    c. Institutional changes such as best management practices (BMPs), standard operating procedures (SOPs) and employee orientation and training were implemented to streamline procedures and increase awareness of source control activities.

16. The Discharger is reconfiguring the LAAs to improve distribution:

    a. Piping improvements for distribution of wastewater over the land application areas were completed in fall 2005. Better distribution will result in more even application of wastewater and better land treatment. A piping connection to the South San Joaquin Irrigation District canal was constructed allowing use of irrigation canal water for supplemental irrigation water.

    b. An 8.3 acre tailwater basin was constructed to capture stormwater and irrigation water from the LAAs, as well as store irrigation district canal water which will be used as supplemental irrigation water.

WASTEWATER SYSTEM

17. The following describes planned changes to the wastewater system. The CDO (R5-2003-0125) required the Discharger to prepare a *Process Water Pretreatment Evaluation Report* to determine the need for pretreatment of wastewater to meet effluent limits. The report determined traditional pretreatment was not required but described several actions to improve wastewater quality. Means to reduce the overall Fixed Dissolved Solids (FDS) discharge are described in the Source Control Section of this Order.

18. Wastewater discharged at the facility is characterized by regular sampling. Data collected from August 2003 through September 2008 is summarized below. Sampling occurs at the PW Sump and is subject to considerable variation in wastewater quality because there is no equalization. The data presented below includes the effect of stormwater dilution.

	pH (std. units)	BOD (mg/L)	NO_3-N (mg/L)	TKN (mg/L)	TN[(a)] (mg/L)	TDS (mg/L)	FDS (mg/l)
average	7.0	3056	0.8	184	185	2,427	1,264
min	1.7	22	0.1	2.0	2.1	140	70
max	12	13000	3.1	1,700	1,703	21,000	7,000

BOD denotes Biochemical Oxygen Demand (5-day). NO_3-N denotes Nitrate as Nitrogen. TKN denotes Total Kjeldahl Nitrogen. TN denotes Total Nitrogen. TDS denotes Total Dissolved Solids. FDS denotes Fixed Dissolved Solids. (a) Indicates the value presented is the sum of NO_3-N and TKN.

19. When grape crushing is re-initiated in 2010, wastewater will be generated from winery sanitation procedures, clean-in-place (CIP) processes, wine racking and fining, wine stabilization ion exchange column regeneration, boiler blowdown, and water softening ion exchange column regeneration. All wastewater and stormwater mixtures are piped to the Process Water Sump (PW Sump). Attachment C, which is attached hereto and made part of this Order by reference, presents a flow diagram that identifies the various wastewater streams.

20. Because the Discharger has not crushed grapes at this facility, information from a similar winery was presented in the RWD. The wastewater quality data was taken from Bronco Winery in Ceres, Stanislaus County, which is owned and operated by the Discharger's parent company.

    a. Wastewater flow rates were estimated based on the relationship of wastewater generated per gallon of wine produced. The Discharger expects to crush 125,000 tons of grapes to make 25 million gallons of wine. Assuming 1.5 gallons of wastewater per gallon of wine, approximately 37.5 million gallons of wastewater will be produced. The values presented below do not include stormwater. Stormwater is addressed in the Stormwater and Water Balance Sections of this Order.

Month	Units	Monthly Flow	Daily Flow
January	gallons	2,625,000	84,677
February	gallons	2,625,000	93,750
March	gallons	3,000,000	96,774
April	gallons	2,625,000	87,500
May	gallons	3,000,000	96,774
June	gallons	2,250,000	75,000
July	gallons	2,250,000	72,581
August	gallons	4,500,000	145,161
September	gallons	4,500,000	150,000
October	gallons	4,500,000	133,065

Month	Units	Monthly Flow	Daily Flow
November	gallons	3,375,000	112,500
December	gallons	2,625,000	84,677
Total	gallons	37,500,000	

b. A summary of estimated average wastewater quality for each month as well as annual averages from Bronco Winery are presented in the table below. The data is based on data collected from Bronco Winery and includes dilution from stormwater mixing with wastewater. The Discharger predicts lower wastewater concentrations as a result of source control in the facility.

Month	pH (std. units)	EC (umhos/cm)	BOD (mg/L)	NO_3-N (mg/L)	TKN (mg/L)	TN[(a)] (mg/L)	TDS (mg/L)	FDS (mg/L)
January	7.0	1,113	704	8.6	12.3	20.9	592	348
February	7.1	2,326	1,038	7.5	26.3	33.8	852	501
March	7.1	1,438	1,013	6.7	26.0	32.7	869	511
April	7.1	1,162	1,128	9.0	31.9	40.9	1,036	610
May	7.3	1,470	1,183	8.4	21.3	29.7	1,182	695
June	7.3	1,407	758	10.3	25.7	36	1,028	605
July	7.3	1,355	551	8.4	10.1	18.5	795	468
August	7.2	1,474	813	8.5	9.4	17.9	923	543
September	7.2	1,497	2,133	6.5	38.4	44.9	1,243	731
October	6.9	1,334	1,906	7.6	25.9	33.5	1,281	754
November	7.1	1,324	936	7.0	11.6	18.6	626	368
December	6.8	1,068	838	9.7	18.5	28.2	911	536
Min	6.8	1,068	551	6.5	9.4	17.9	592	348
Max	7.3	2,326	2,133	10.3	38.4	44.9	1,281	754
Average	7.12	1,414	1,083	8.2	21.5	29.6	945	556

EC denotes Electrical Conductivity. BOD denotes Biochemical Oxygen Demand (5-day). NO_3-N denotes Nitrate as Nitrogen. TKN denotes Total Kjeldahl Nitrogen. TN denotes Total Nitrogen. TDS denotes Total Dissolved Solids. FDS denotes Fixed Dissolved Solids.
(a) Indicates the value presented is the sum of NO_3-N and TKN.

c. The crush season is typically from September through November. Review of the data presented in the table above indicates the highest flow rates occur in that time period. In addition, higher concentrations of biochemical oxygen demand occur during crush.

d. Wastewater quality can vary significantly over short periods of time. Transportation of wine and/or pipeline sanitization practices often results in short term discharges of wine (or other compounds) to the wastewater system. Although the discharge is a relatively small volume, it may have a low pH (in the case where wine is discharged). To avoid the FDS increase that would result from pH neutralization, short term discharges of low pH are considered acceptable because ample soil

buffering likely exists. This will be evaluated in the Crop Uptake and Assimilative Capacity report.

21. The Discharger will use a number of chemicals in the wine making, processing, cleaning, and sanitation processes that will be performed at the facility. The current chemicals and quantities used at the facility are identified below. The future chemicals and quantities will change based on the Best Practicable Treatment and Control (BPTC) measures that are implemented and the ultimate build-out of the facility.

Chemical	Use	Quantity/year
Ammonium Hydroxide (99%)	Wine IX Neutralizer	42,000 lbs
Sulfuric Acid (93%)	Wine IX Column	149,600 lbs
Sodium Chloride (100%)	Boiler IX Column	Unknown
Sodium Hydroxide (50%)	Sanitation	6,550 lbs
Potassium Hydroxide (22.5%)	Sanitation	1,400 gallons
Sodium Hypochlorite (12.5%)	Disinfection	7,600 gallons

IX denotes Ion Exchange.

22. As described above, winery sanitation practices include use of sodium and potassium hydroxide, and sodium hypochlorite. Use of such compounds will result in an increased FDS concentration in the facility wastewater. In addition, the use of chlorine compounds may result in formation of trihalomethanes (THMs) in the wastewater.

23. CIP solutions will be discharged to the wastewater system. The CIP discharge will likely contain high concentrations of FDS. The CIP cleaning routine will consist of a water rinse, potassium hydroxide caustic wash, water rinse, and final ozoneated rinse for sanitation.

24. Wine stabilization is performed using an ion exchange treatment system. Sulfuric acid is used to regenerate the ion exchange beds and ammonium hydroxide is used to neutralize the regeneration waste stream.

25. The Discharger will operate a boiler to provide hot water at the facility. Presently, boiler feed water is treated with an ion exchange water softener. Waste streams associated with boilers and ion exchange water softening contain significantly higher concentrations of FDS. Ion exchange regeneration waste streams often contain FDS concentrations of 60,000 to 100,000 mg/L. In the future, the ion exchange system will be replaced with a reverse osmosis system which will reduce the FDS loading rate.

26. Boiler blowdown will be discharged to the wastewater system. However, the contribution of FDS load from the boiler blowdown is anticipated to be a minor contribution to the total FDS load.

27. The Discharger will use four 250,000 gallon above ground Process Water Tanks (PW Tanks) for wastewater storage and equalization. The storage capacity can provide several days' storage based on estimated flow rates. The tanks will be equipped with a coarse bubble diffused aeration system. Climatic conditions or LAA conditions

(saturated soil, odors, etc.) may require winery process schedule changes to comply with the discharge specifications contained in this Order.

28. This Order requires the Discharger to evaluate and implement salt reduction techniques. It is appropriate for the Discharger to closely evaluate the use of the chemicals and determine if there are other cleaning methods that do not contribute to elevated FDS concentrations in the waste stream. It may be appropriate for the Discharger to implement an alternative disposal method for ion exchange regeneration brine, boiler blowdown, CIP solutions, and tank cleaning solutions.

SOURCE CONTROL

29. A number of improvements have been implemented, or are planned for implementation, that will result in better quality wastewater. Numerous BPTC measures have been incorporated into the planning and design of the winery. These improvements are described below:

    a. The Discharger will reuse process water for cleaning operations. Reducing the amount of water the facility uses will reduce FDS originating in the supply water.

    b. A CIP system will be used at the facility for tank and pipe cleaning. Caustic cleaners will be recycled to reduce the amount of caustic used. CIP systems can use water more efficiently, reducing the overall water use at the facility. Use of potassium hydroxide in place of sodium hydroxide reduces the threat to groundwater quality because potassium can be taken up by crops in the LAAs. In addition, potassium does not affect soil structure as does sodium.

    c. Ozone will be used in the CIP system in place of chlorine disinfection agents. In addition to removing chlorine and the formation of disinfection byproducts, ozone does not require a final rinse. The use of sodium hypochlorite is anticipated to be reduced approximately 60-percent.

    d. Evaluation of separating wine ion exchange regenerate, which consists of sulfuric acid, is being performed. The regeneration waste stream may be useful in descaling irrigation systems. If the material can be used off-site, the Discharger anticipates an overall reduction in FDS loading of 20-percent due to the sulfuric acid and neutralizing chemical waste stream. However, use of the material is beyond the scope of this Order; authorization to use the material may require authorization by other governmental agencies.

    e. Boiler feed water will be treated using reverse osmosis. Until the reverse osmosis system is on-line, an ion exchange system will be used. The ion exchange regeneration waste stream will be separated from the wastewater system and disposed of at East Bay Municipal Utilities District in Oakland. The Discharger has installed a small boiler that is more efficient requiring less frequent blowdown. The changes are anticipated to reduce the quantity of blowdown and the FDS loading of the wastewater system.

f. Refrigeration at the facility has been improved. New tanks are better insulated, and cooling equipment has been replaced with closed-loop systems. The improvements will reduce the amount of cooling water discharged.

g. Institutional changes will be implemented to educate employees on the importance of source control through water conservation, reuse, and source control.

h. One of two wine treatment ion exchange units was removed from service in spring 2004. Although this may result in a reduction in the ion exchange regeneration waste stream added to wastewater, if the same volume of wine is treated as has been historically, then no change in wastewater quality would be anticipated. The Discharger is evaluating the use of the regenerate wastestream (sulfuric acid) as a descaling agent for drip irrigation systems. Due to the chemical properties of the sulfuric acid waste stream, other authorization (from other government agencies) may be required for the proposed use.

i. Tanks providing 10 million gallons of storage will be removed and replaced with new storage tanks. New stainless steel tanks will be constructed at a rate providing approximately 4.2 million gallons of new storage every year for 5 years. The new tanks will reduce refrigeration requirements (due to insulation) and therefore result in less evaporative condenser blowdown. The stored wine is also circulated through the heat exchangers less frequently due to the insulation and therefore less pipe cleaning and sanitation is required. In addition, the new stainless steel tanks replaced 3.5 million gallons of redwood tanks that required more extensive cleaning. Redwood tanks also must remain filled with water and sulfur dioxide when not storing wine to prevent the tanks from drying out. Stainless steel tanks will require less cleaning effort, which will result in less high strength wastewater generated per storage tank.

WATER BALANCE

30. The 10 November 2008 RWD Addendum contains a water balance for the wastewater treatment, storage, and land application system. The water balance demonstrated that the facility can contain an annual wastewater discharge of 37.5 Mgal, 100-year annual return rainfall amounts, and 58.4 acres of LAA. Because there is no accurate way to predict how much stormwater can be diverted in the future, all of the stormwater that falls on the facility is assumed discharged to the land application area. The water balance included 10.3 Mgal of stormwater for a total discharge to the LAAs of 47.8 Mgal.

31. To supply adequate water to cropped LAAs, during normal precipitation years the Discharger will supplement the wastewater application with 34.9 Mgal of irrigation water. During 100-year return precipitation years, 30.1 Mgal of irrigation water will be added to the LAAs.

STORMWATER SYSTEM

32. Stormwater that falls on the parking lot is discharged to the adjacent surrounding area. Rainwater that falls on the remainder of the processing portion of the facility is comingled with the process water and discharged to the land application areas via the PW Sump and PW Tanks. The Discharger is planning to separate relatively uncontaminated stormwater from the wastewater system and discharge the stormwater to a stormwater basin that will be constructed. The plan consists of the following elements:

    a. A programmable logic controller (PLC) will be installed to control the diversion of stormwater from the wastewater system. Stormwater will be diverted when all of the following occur: processing activities are not occurring (to be controlled with a manual switch), at least 0.25-inch of stormwater has fallen at the facility (to be measured with an on-site rain gauge), and an electrical conductivity measurement in the PW Sump is 500 umhos/cm or less (an EC meter will be installed in the PW Sump).

    b. To minimize the amount of wastewater constituents discharged to the stormwater basin, the PLC controller will activate air pulse mixing plates anchored to the bottom of the sump when rain is detected by the rain gauge. The aeration system will suspend settled solids in the sump so that they can be pumped to the PW tanks.

    c. A stormwater basin providing 1.6 million gallons of storage will be located at the western edge of the property. It will be 1,125 feet long, 25 feet wide and 7 feet deep. The gravel truck staging area will be sloped towards the basin so that water from the stormwater basin can overflow onto the parking lot. As a result of normal climatic conditions, stormwater overflowing onto the parking area is unlikely to occur during the crush season.

    d. A Stormwater Pollution Prevention Plan will be prepared to address how the facility will control stormwater from being mixed with wastewater.

    e. The stormwater system improvements will be installed in Summer 2009 with testing during the 2009/2010 winter season.

LAND APPLICATION SYSTEM

33. Historically, 108 acres of land application area was available for use at the site; as a result of facility expansion, approximately 45.9 acres will be converted to buildings or wine storage/processing use and will not be available for wastewater application. The locations of the LAAs are presented on Attachment B. Because there is limited wastewater storage at the facility, wastewater will be applied during the winter season.

    a. The Discharger proposes to crop the LAAs. Wastewater will be applied by flood irrigation. A sprinkler irrigation system may be installed in the future, and is acceptable as long as wastewater applications are performed consistent with the

requirements in this Order. Flood irrigation is acceptable as long as the LAA is prepared to allow even distribution and prevent spills of wastewater/supplemental irrigation water outside the LAA.

b. A summary of the process water storage tanks, land application areas, and tailwater or stormwater basins are presented below:

Feature	Name	Comments
Process Water Tank 1	PW Tank 1	250,000 gallons
Process Water Tank 2	PW Tank 2	250,000 gallons
Process Water Tank 3	PW Tank 3	250,000 gallons
Process Water Tank 4	PW Tank 4	250,000 gallons
Land Application Area 1	LAA-1	58 Acres
Land Application Area 2	LAA-2	6 Acres
Land Application Area 3	LAA-3	3.5 Acres
Land Application Area 4	LAA-4	2 Acres
Tailwater Basin	Tailwater Basin	8.3 Acres, 18 Mgal capacity
Stormwater Basin	Stormwater Basin	0.65 Acres, 1.6 Mgal capacity

34. A tailwater collection basin was constructed in the northern portion of the land application area in 2007. The basin location is shown on Attachment B. The basin will receive stormwater and supplemental irrigation runoff from the land application areas. The basin is approximately 10-feet deep and was not constructed with a low permeability liner (either natural or synthetic).

    a. The purpose of the basin is to collect irrigation district water when it is delivered and to collect stormwater that falls on the LAAs. Water quality monitoring will be performed to verify wastewater is not discharged directly to the basin.

    b. Drainage of irrigation water or stormwater into the tailwater basin is controlled by valves located at the northeast and southeast corners of the basin. Soil is placed in front of the gate valves. When surface water is to be drained from the LAAs, the dirt is removed with shovels and the valves are opened.

    c. During the summer, if water enters the tailwater basin, it will be reapplied to the LAAs during the next irrigation cycle. During the winter, if water enters the tailwater basin, it will be reapplied to LAAs as soon as conditions permit. The RWD states that because the checks in the LAAs are surrounded by berms, stormwater can be prevented from draining into the tailwater basin if process water had not percolated before the storm event.

35. Crops will be cut and removed from the LAAs. Removal of the crop will remove nitrogen and dissolved solids that are taken up by the crop.

    a. TDS is composed of both Volatile Dissolved Solids (VDS) and Fixed Dissolved Solids (FDS). The proportion of VDS to FDS in wastewater varies with the source, but 50-percent of the TDS in winery wastewater may be in the volatile form. The

VDS can be biologically treated by soil microorganisms in a well-managed wastewater treatment and land application system, when wastewater is not over-applied. The Discharger has presented both TDS and FDS concentrations in the RWD based on monitoring performed at a similar winery (Bronco Winery). The average FDS concentration is 556 mg/L. Based on the anticipated average annual wastewater flow rate of 41.5 Mgal (37.5 Mgal of wastewater and 4.0 Mgal of stormwater), approximately 192,437 pounds/year of FDS will be applied (2,769 lbs/ac•year). The Discharger has stated crop uptake rates of 2,400 lbs/ac•year are possible. This order requires determination of site-specific crop uptake rates. That information will be provided in a Crop Uptake and Assimilative Capacity (CUAC) report.

36. The Discharger has estimated the average total nitrogen concentration in wastewater to be 21.5 mg/L. Based on the anticipated average annual wastewater flow rate (41.5 Mgal), approximately 7,441 pounds/year of total nitrogen will be applied (107 lbs/ac•year). The 69.5 acre LAAs planted in crops generally will take up at least 200 lbs/ac•year. The proposed nitrogen loading rate is unlikely to degrade groundwater quality.

SOLID WASTE

37. Pomace and spent diatomaceous earth (DE) generated in wine making processes will be placed on the Pomace/DE pad. The Pomace/DE pad is constructed of concrete and equipped with a sump that collects liquid that drains from the material and any storm water that falls on the pad. Liquids (wastewater and comingled stormwater) are discharged to the wastewater system.

38. Storage of pomace and DE on bare ground after the initial drying on the Pomace/DE pad is likely to allow stormwater to mobilize residual waste constituents. Such storage is not protective of groundwater quality.

39. Pomace will be removed daily during the crush season; DE will be removed as needed. The material will be taken off-site for disposal. The material can be applied to cropland as a beneficial soil amendment. If it is composted, the composting facility must be a permitted green waste facility, or be listed for permitting when the Green Waste General Order is prepared.

GROUNDWATER CONDITIONS

40. The Discharger has identified a dairy with associated dairy wastewater land application areas, and stated the dairy's activities have impacted groundwater quality off-site and at the winery. Review of groundwater monitoring well and CPT data indicates some degradation of groundwater quality is likely the result of the dairy activities, but the past winery operations have also caused groundwater degradation. The dairy activities have influenced determination of the background groundwater quality in this evaluation.

41. Water supply is provided from three production wells (Wells 1, 3, and 4). Domestic

water is provided by two domestic water wells (Wells A and B); a fire fighting well also exists. The production wells are reported to have been installed in the 1960's but information on the construction details is not available. The domestic wells were drilled in November 2000 to a depth of 300 feet and were constructed with screen lengths of 20 feet (Well A) and 40 feet (Well B). The wells were sampled infrequently from June 2001 to February 2004. The Discharger's 30 May 2007 Groundwater Characterization Report presented the following data on the production/domestic wells:

Analyte	Units	PW-1	PW-3	PW-4	Well A	Well B	WQL
EC	umhos/cm	470	500	435	275	301	700 [1]
TDS	mg/L	377	395	340	180	240	450 [1]
NH_3-N	mg/L	<1	<1	<1	NR	NR	1.5 [2]
Ca	mg/L	41	45	37	18	19	NA
Mg	mg/L	20	22	20	10	11	NA
Na	mg/L	24	24	22	20	22	69 [1]
SO_4	mg/L	32	37	33	5	5	250 [3]
Cl	mg/L	7.0	11	8.3	9	10	106 [1]
HCO_3	mg/L	183	200	173	120	130	NA
Hardness	mg/L	185	205	175	86.1	92.7	NA
Alkalinity	mg/L	147	163	142	100	110	NA

EC denotes Electrical Conductivity. TDS denotes Total Dissolved Solids. NO_3-N denotes Nitrate as Nitrogen. TN denotes Total Nitrogen. WQL denotes Water Quality Limit, which are included routinely for comparison purposes.

[1] Agricultural Water Quality Goals. [2] Taste and Odor Threshold. [3] Recommended Secondary Maximum Contaminant Level (Drinking Water). NA denotes Not Available.

42. In June 2000, the Discharger constructed five groundwater monitoring wells at the facility; an additional two wells (MW-6 and MW-7) were constructed in December 2003. The well locations are shown on Attachment B.

Well Name	Date Constructed	Screened Interval (ft. bgs)	Casing Elevation (ft. msl)
MW-1	6/19/00	45-75	98.85
MW-2	6/23/00	45-75	96.79
MW-3	6/23/00	47-77	99.17
MW-4	6/20/00	47-77	98.46
MW-5	6/21/00	45-75	95.28
MW-6	11/18/03	54-69	96.61
MW-7	11/18/03	52-67	99.58

Note: Data from 11/10/08 RWD Amendment prepared by Kennedy/Jenks Consultants.

43. Based on the available data, the groundwater elevation first occurs approximately 60 feet below the ground surface and groundwater flows toward the northwest. Groundwater at the facility may have an elevation approximately 10 feet above the regional groundwater elevation. It is unclear if the difference is due to regional wells being screened in a confined aquifer or if mounding exists at the facility.

44. Quarterly monitoring has been performed since October 2001 for Wells MW-1 through MW-5; monitoring for Wells MW-6 and MW-7 has been performed since February 2004. Well MW-1 is located upgradient of the facility; Wells MW-2, MW-4, and MW-5 are located downgradient of LAAs; Well MW-3 is located downgradient of the former cooling water LAA. Well MW-6 and MW-7 are located at the upgradient side of LAAs. Average concentrations for selected analytes are summarized in the following table: (Note: groundwater quality is discussed in Findings No. 46 and 47 after other relevant data are presented). The Discharger's evaluation is summarized in Finding No. 49.

Analyte	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	WQL
EC	umhos/cm	682	1,432	586	1,880	1,772	904	1,608	700 [1]
TDS	mg/L	477	1,006	401	1,359	1,165	625	1,051	450 [1]
NO_3-N	mg/L	14	24	5.0	4.3	4.9	36	49	10 [2]
TN	mg/L	18	25	6	5	6	37	51	NA
Ca	mg/L	74	161	69	213	197	96	185	NA
Mg	mg/L	38	71	36	107	103	48	90	NA
Na	mg/L	26	65	32	111	71	25	32	69 [1]
SO_4	mg/L	63	181	58	403	89	46	68	250 [3]
Cl	mg/L	12	50	15	94	116	39	120	106 [1]
HCO_3	mg/L	281	507	245	788	1,035	289	523	NA
Hardness	mg/L	339	720	326	972	936	438	830	NA
Alkalinity	mg/L	244	425	201	634	786	243	428	NA

EC denotes Electrical Conductivity. TDS denotes Total Dissolved Solids. NO_3-N denotes Nitrate as Nitrogen. TN denotes Total Nitrogen. WQL denotes Water Quality Limit.

[1] Agricultural Water Quality Goals. [2] Primary Maximum Contaminant Level (Drinking Water). [3] Recommended Secondary Maximum Contaminant Level (Drinking Water). NA denotes Not Available.

45. In January 2007, 14 Cone Penetration Tests (CPTs) were completed. One CPT could not be advanced due to subsurface conditions. At each successful CPT location, a second direct push probe was advanced to allow collection of grab groundwater samples. Samples were collected at depths varying between 62 and 86 feet below ground surface. All the samples were collected from the most permeable zone encountered in the CPT hole. The CPT locations are presented on Attachment D, which is attached hereto and is made part of this Order by reference. The data is presented below:

Analyte	Units	CT-1	CT-2	CT-2-D	CT-3	CT-4	CT-5	CT-6	CT-7	CT-8	CT-9	CT-10	CT-12	CT-13	CT-14
Sam Dep	feet bgs	66	66	NR	67	86	66	64	64	63	80	65/75	68	54/62	70
pH	std.	7.7	7.4	7.4	7.3	7.2	8.6	8.1	7.5	7.4	7.3	7.2	7.1	7.1	7.4
EC	umho/cm	520	760	770	770	1,100	710	720	1,800	1,700	800	860	920	2,200	1,600
TDS	mg/L	430	550	530	570	770	530	560	1,500	1,500	960	690	640	1,600	1,300
Ca	mg/L	220	340	290	370	270	260	210	410	450	610	210	310	640	310
Mg	mg/L	14	180	150	200	140	92	61	200	240	290	140	210	340	140
Na	mg/L	45	58	51	54	53	48	55	130	100	94	53	55	220	77
K	mg/L	44	48	40	48	51	45	37	74	46	59	48	53	61	53
Fe	mg/L	150	300	290	220	150	130	88	250	240	230	250	210	210	130

Analyte	Units	CT-1	CT-2	CT-2-D	CT-3	CT-4	CT-5	CT-6	CT-7	CT-8	CT-9	CT-10	CT-12	CT-13	CT-14
SO_4	mg/L	39	65	66	30	50	64	53	200	360	61	25	59	200	240
Cl	mg/L	16	15	15	25	77	17	12	67	110	82	22	35	110	86
NO_3-N	mg/L	29.4	12	27.1	11.7	33.9	24.8	20.3	108	45.2	47.4	9	33.9	<20	31.6
TKN	mg/L	2.2	1.3	2.6	2.4	2.9	2.2	3.9	9.8	6.6	2.6	1.6	4.1	8.9	3.8
NH_3-N	mg/L	<1	<1	<1	<1	<1	<1	<1	<4	<4	<1	<1	<1	<4	<1
Hardness	mg/L	960	1,600	1,300	1,700	1,300	1,000	780	1,800	2,100	2,700	1,100	1,600	3,000	1,400
Alkalinity	mg/L	120	270	280	350	360	340	310	470	400	440	440	280	1,100	510

EC denotes Electrical Conductivity. TDS denotes Total Dissolved Solids. Ca denotes calcium. Mg denotes magnesium. Na denotes sodium. K denotes potassium. Fe denotes iron. SO_4 denotes sulfate. Cl denotes chloride. NO_3-N denotes nitrate as nitrogen. TKN denotes total Kjeldahl nitrogen. NH_3-N denotes ammonia as nitrogen. NR denotes Not Reported. <1 denotes not detected, detection limit shown. Sam Dep denotes Sample Depth.

46. Review of the data in the tables presented in Findings 44 and 45 indicates a characteristic pattern of analytes in facility groundwater. The characteristic pattern generally includes the lowest concentrations observed in Wells MW-1 and MW-3. Well MW-1 is upgradient of the facility; Well MW-3 is upgradient of most waste application areas with the exception of the former cooling water land application area to which wastewater with lower concentrations of TDS/FDS/EC were applied (estimated to be approximately 300 mg/L of TDS in the 12 August 2004 *Effluent Limitation Determination Technical Report* prepared by Kennedy Jenks). The following observations on the waste constituent concentration trends were observed:

    a. The average Electrical Conductivity (EC) distribution is consistent with the characteristic pattern. The average EC in Well MW-1 (682 umho/cm) and MW-3 (586 umho/cm) are less than the WQL (700 umho/cm). The maximum average EC at the site was reported in Well MW-4 (1,880 umho/cm). The distribution indicates wastewater application has impacted groundwater quality.

    b. The average TDS distribution is consistent with the characteristic pattern. The average TDS concentration in Well MW-1 (477 mg/L) and MW-3 (401 mg/L) are close to or less than the WQL (450 mg/L). The maximum average TDS at the site was reported in Well MW-4 (1,359 mg/L). TDS concentrations in Wells MW-6 (630 mg/L) and MW-7 (1,000 mg/L), both located at the upgradient edge of the land application area are higher than the background groundwater concentration, but lower than the concentrations in wells located downgradient of the land application area. This distribution may indicate groundwater degradation from upgradient sources or mixing of wastewater constituents from the land application area, but does indicate groundwater quality degradation from application of wastewater to the land application area.

    c. The average NO_3-N distribution is not consistent with the characteristic pattern. The average NO_3-N concentration in Wells MW-3 (5.0), MW-4 (4.3 mg/L), and MW-5 (4.9 mg/L) are less than the WQL (10 mg/L). The maximum average nitrate concentration was reported in Well MW-7 (49 mg/L). This pattern may indicate that some waste constituents originate off-site. The low concentration of nitrate in Wells MW-4 and MW-5 (which are downgradient of the land application area) may

indicate some mounding of groundwater below the land application area exists or existed when they were subject to heavy hydraulic loading.

d. The average sodium distribution is consistent with the characteristic pattern. The lowest concentration average sodium concentration was reported in Well MW-1 (26 mg/L); the highest average sodium concentration was reported in Well MW-4 (111 mg/L). The distribution of sodium concentrations indicates groundwater quality degradation and is similar to the distribution of TDS as described above.

e. The average sulfate distribution is generally consistent with the characteristic pattern. The average sulfate concentration in Wells MW-1 (63 mg/L), MW-3 (58 mg/L), MW-5 (89 mg/L), MW-6 (46 mg/L), and MW-7 (68 mg/L) are less than the WQL (250 mg/L). The highest average sulfate concentration was reported in Well MW-4 (403 mg/L). The concentration of sulfate in Wells MW-4 and MW-5 indicates groundwater quality degradation as a result of wastewater application.

f. The average chloride distribution is consistent with the characteristic pattern. The average chloride concentration in Wells MW-1 (12 mg/L), MW-2 (50 mg/L), MW-3 (15 mg/L), MW-4 (94 mg/L), and MW-6 (39 mg/L) are less than the WQL (106 mg/L). The highest average chloride concentration was reported in Well MW-7 (120 mg/L); the average concentration in Well MW-5 (116 mg/L) also exceeded the WQL. The distribution of chloride concentrations indicates groundwater quality degradation and is similar to the distribution of TDS as described above.

47. The data indicate that groundwater below the LAAs has been impacted by dissolved solids from the discharge of wastewater. The CPT data are generally consistent with the monitoring well data and may indicate some off-site groundwater quality degradation has occurred as a result of application of dairy wastewater or other off-site activity. Therefore, it is important to consider the extent of winery and dairy wastewater application when establishing the estimate of background groundwater quality. The dairy LAA locations are presented on Attachment D. The following summarizes the background groundwater quality conditions:

    a. The northern area of the site consists of the 58 acre LAA, and 8.3 acre tailwater basin. The groundwater in the northern area has likely been impacted by waste application activities.

        i. Upgradient groundwater quality in the northern area of the site is best characterized by the groundwater quality of Well MW-6. Groundwater quality may be impacted by upgradient waste application areas as well as wastewater percolating from the on-site LAAs.

    b. The southern portion of the site consists of the remainder of the facility. The groundwater in the southern area may have been impacted by waste application activities from off-site.

        i. The southern portion of the site is best characterized by the groundwater quality of Well MW-1. Groundwater quality in Well MW-1 is considered unimpacted by upgradient waste application areas.

48. The table below presents average background groundwater concentrations. These may be used to comply with the Groundwater Limitations of this Order or the Discharger may

use another applicable statistical method to calculate background conditions as required by this Order. Water quality limits are also included for comparison purposes.

Analyte	Units	MW-1 [a]	MW-6 [a]	WQL
Electrical Conductivity	umhos/cm	682	904	700 [1]
Total Dissolved Solids	mg/L	477	625	450 [1]
Nitrate as Nitrogen	mg/L	14	36	10 [2]
Sodium	mg/L	26	25	69 [1]
Chloride	mg/L	12	39	106 [1]

[a] The data presented are averages. [1] Agricultural Water Quality Goals. [2] Primary Maximum Contaminant Level (Drinking Water). NA denotes Not Available.

49. The Discharger submitted a 30 May 2007 *Groundwater Characterization Report*, prepared by Kennedy/Jenks Consultants that summarized all groundwater data collected to date and provided an interpretation of groundwater conditions at the facility. The report concluded the following:

    a. There are statistically significant increases in groundwater concentrations for TDS, chloride, sodium, and sulfate between the upgradient well (MW-1) and a selected downgradient well (Well MW-5).

    b. The groundwater elevation at the facility is generally approximately 10-feet higher than the groundwater in off-site residential and irrigation wells.

    c. Groundwater quality may be impacted from land application of wastewater from a nearby dairy and other regional agricultural activities. But the winery activities have further degraded groundwater quality.

    d. Groundwater quality at the background well (MW-1) may be influenced by historic land application of relatively low TDS concentration cooling tower water. (Note: the report does not present a mechanism to explain how the cooling water flowed upgradient to the location of Well MW-1).

SITE SPECIFIC CONDITIONS

50. Surrounding land uses are agricultural and residential. The topography of the surrounding area is relatively flat.

51. G&H Dairy is located at 16996 Sexton Road, Escalon. The dairy is approximately 1,200 feet east of the winery facility. Dairy wastewater is applied to land east, north, and west of the winery; some of the those LAAs are located adjacent to the winery LAAs. The location of the dairy and the dairy's associated land application areas are presented on Attachment D.

52. Shallow soils are described in the RWD as Delhi loamy soil (infiltration rate 3.0 inches per hour) and the Veritas fine loamy sand (infiltration rate 1.5 inches per hour). Deeper soil characterized in the monitoring well borings consists of sand and silt soil types.

53. The mean annual rainfall is approximately 12.9 inches, and the reference evapotranspiration rate for the Escalon vicinity is approximately 52.1 inches. The 100-year return annual precipitation is 23.29-inches according to the Department of Water Resources.

54. The facility is within the Manteca Hydrologic Area (No. 535.10), as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.

55. The facility currently employs approximately 20 employees in one eight-hour shift per day. Staffing is expected to increase to 26 employees during the non-crush season and 52 employees during the crush season. Domestic wastewater is discharged to septic systems. There is no tasting room, so the septic systems primarily serve winery employees. The systems are regulated by the San Joaquin County Environmental Health Department. The septic tanks are pumped regularly and the waste is discharged to the City of Manteca wastewater treatment facility. Septic tanks at the facility are described below:

Tank No.	Location	Tank Size (gal)
1	Engineering Office	1,200
2	Main Office	1,200
3	South Restroom	800
4	West Restroom	1,200
5	Women's Restroom	800
6	Maintenance	800
7	East Restroom	1,200
8	Scale House	1,200
9	Main House	1,200

56. The site is outside the 100-year flood zone.

OTHER CONSIDERATIONS FOR FOOD PROCESSING WASTE

57. Excessive application of food processing wastewater to land application areas can create objectionable odors, soil conditions that are harmful to crops, and degradation of underlying groundwater by overloading the shallow soil profile and causing waste constituents (organic carbon, nitrate, other salts, and metals) to percolate below the root zone. Ordinarily, it is reasonable to expect some attenuation of various waste constituents that percolate below the root zone within the vadose (unsaturated) zone. Specifically, excess nitrogen can be mineralized and denitrified by soil microorganisms, organic constituents (measured as both BOD and volatile dissolved solids) can be oxidized, and some salinity species will undergo cation exchange with clay minerals, effectively immobilizing them.

58. Loading of BOD should be limited to prevent nuisance conditions. The maximum BOD loading rate that can be applied to land without creating nuisance conditions can vary significantly depending on the operation of the land application system. *Pollution*

Abatement in the Fruit and Vegetable Industry, published by the United States Environmental Protection Agency (US EPA Publication No. 625/3-77-0007) (hereafter *Pollution Abatement*), cites BOD loading rates in the range of 36 lbs/acre•day to 600 lbs/acre•day but indicates the loading rates can be even higher under certain conditions. In no case shall the loadings cause a nuisance.

59. Acidic and/or reducing soil conditions can be detrimental to land treatment system function, and may cause groundwater degradation if the buffering capacity of the soil is exceeded. If soil pH decreases below 5 and the soil remains in a reducing state for prolonged periods, naturally occurring metals (including iron and manganese) could dissolve and degrade underlying groundwater. In practice, prolonged reducing conditions may not occur because: a) the annual cycle of lowered pH during loading with either process water or fertilizer is followed by pH recovery during cropping and organic matter cycling and; b) the dose and rest cycling for process water application either in spreading basins or using irrigation creates alternate anoxic and aerobic conditions. *Pollution Abatement* recommends that water applied to crops have a pH within 6.4 to 8.4 to protect crops. The soils and underlying groundwater are expected to adequately buffer the discharge.

BASIN PLAN, BENEFICIAL USES, AND REGULATORY CONSIDERATIONS

60. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board. Pursuant to Section 13263(a) of the California Water Code (CWC), waste discharge requirements must implement the Basin Plan.

61. Surface water drainage is to the South San Joaquin Irrigation Canal, tributary to Lone Tree Creek and the San Joaquin River in the Sacramento San Joaquin Delta.

62. The beneficial uses of the San Joaquin River (within the Sacramento San Joaquin Delta Hydrologic Area) are municipal and domestic supply; agricultural supply; industrial process supply; industrial service supply; water contact recreation; non-contact water recreation; warm fresh water habitat; cold fresh water habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.

63. The beneficial uses of underlying groundwater are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

64. State Water Resources Control Board (State Board) Resolution No. 68-16 (the Antidegradation Policy) requires that the Regional Water Board, in regulating the discharge of waste, must maintain the high quality of waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution No. 68-16 also requires that

waste discharged to high quality waters be required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge. Resolution 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for an increased volume or concentration of waste.

65. The facility has been in operation for over 100 years. Area groundwater has also been impacted by surrounding dairy operations. Degradation caused by prior activities at the facility may require corrective action.

However, limited degradation of high-quality groundwater by some of the typical waste constituents released with discharge from a winery (after effective source control, treatment, and control) may be consistent with maximum benefit to the people of California at appropriate sites. When allowed, the degree of degradation permitted depends upon many factors (i.e., background water quality, the waste constituent, the beneficial uses and water quality objectives, management practices, source control measures, waste constituent treatability).

This Order does not allow an increased volume of waste or an increase in wastewater flow compared to the discharges allowed in Order 91-233. Although the concentration of wastes will increase somewhat, the total volume of waste will not increase due to the reduction in the permitted wastewater flow. This Order therefore does not allow any increased degradation of groundwater.

The Discharger cannot fully evaluate actual impacts on groundwater until completion of crop studies, and implementation and monitoring of new or planned facility upgrades (see Findings 13, 15-20, 26, 29, and 33-39), and any additional measures that will be required to comply with Provision G.1.

This Order limits the wastewater discharge to 40% of the previous winery wastewater discharge, imposes new effluent limitations, and limits land application of nitrogen to agronomic rates. The Discharger is prohibited from resuming the prior distillery operations, which produced a higher strength waste than the proposed crushing andn bottling. This Order contains tasks for assuring that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved. Upon completion of the scheduled tasks, this Order will therefore prohibit the Discharger from causing or contributing to an exceedence of groundwater objectives, and minimizes any degradation that may occur pending completion of the required tasks. Completion of these tasks, and implementation of the approved strategies developed from that work, will ensure that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

The Discharger expects the facility to provide 26 year-round and 26 seasonal jobs. Prohibiting discharges pending completion of the required facility upgrades could eliminate some or all those jobs. In addition, it is reasonable to assume that the facility provides an economic benefit to the growers that will use the crushing facilities, and to equipment suppliers and transportation companies. Any limited, short-term degradation that may result while the Discharger completes the required studies is consistent with maximum benefit to the people of the State. This Order establishes requirements to

ensure the discharge will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. This Order establishes effluent limitations that are protective of the beneficial uses of the underlying groundwater, requires a salinity source reduction, and requires the sampling of groundwater monitoring wells to determine if the discharge of waste further impacts the underlying groundwater quality. Based on the result of the scheduled tasks, this Order may be reopened to reconsider effluent limitations and other requirements to comply with Resolution 68-16. Accordingly, the discharge is consistent with the antidegradation provisions of Resolution 68-16.

66. Based on the threat and complexity of the discharge, the facility is determined to be classified 2-B as defined below:

    a. Category 2 threat to water quality, defined as, "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short term violation of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."

    b. Category B complexity, defined as, "Any discharger not included above that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal) or any Class 2 or Class 3 waste management units.

67. California Water Code Section13267(b) provides that: "*In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports*."

    The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2009-____" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that generates the waste subject to this Order.

68. California Department of Water Resources standards for the construction and destruction of groundwater wells is described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to CWC Section 13801, apply to all monitoring wells.

69. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27. The data analysis methods of Title 27 may be appropriate for determining

whether the discharge complies with the terms for protection of groundwater specified in this Order.

70. The discharge of wastewater is exempt from the requirements of *Consolidated Regulation for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq., (Title 27). The exemption, pursuant to Section 20090(b), is based on the following:

a. The Regional Water Board is issuing waste discharge requirements,

b. These waste discharge requirements, including the Effluent Limitations, Land Application Area Requirements and the compliance schedule in Provision G.1, require the discharge to comply with the Basin Plan on or before 1 February 2013 for fixed dissolved solids and 26 November 2012 for other constituents, and

c. The wastewater does not need to be managed according to Title 22 CCR, Division 4.5, and Chapter 11, as a hazardous waste.

71. Federal regulations for storm water discharges were promulgated by the U.S. Environmental Protection Agency on 16 November 1990 (40 CFR Parts 122, 123, and 124). The State Board adopted Order No. 97-03-DWQ (General Permit No. CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. The Discharger has not yet obtained coverage under General Permit No. CAS000001 and may be required to do so.

72. The Discharger's operations at the facility involve negligible or no expansion of the crushing and fermenting operations covered by Order No. 91-223. Order No. 91-223 authorized discharge of 0.4 mgd of winery wastewater (excluding 1 mgd of cooling water discharges that have been discontinued). The wastewater resulted from grape crushing, distilling and bottling operations. These WDRs only allow discharges of 0.16 mgd (160,000 thousand gallons per day) of combined wastewater and stormwater, include a new annual flow limitation and prohibit distilling, which produces high-strength waste. The Discharger constructed a stormwater basin prior to submitting its RWD. The basin is therefore part of the project "baseline." In addition, the Discharger will only use the basin to store stormwater, tailwater and irrigation water. Similar quantities of stormwater, tailwater and irrigation water were discharged at the facility's land application areas before construction of the basin in accordance with Order No. 91-223. The action to adopt WDRs for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), in accordance with Title 14, California Code of Regulations (CCR), Section 15301.

73. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

PUBLIC NOTICE

74. All the above and the supplemental information and details in the attached Information Sheet, incorporated by reference herein, were considered in establishing the following conditions of discharge.

75. The Discharger and interested agencies and persons were notified of the intent to prescribe WDRs for this discharge and provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

76. In a public meeting, all comments pertaining to the discharge were heard and considered.

IT IS HEREBY ORDERED that Order No. 91-223 is rescinded and pursuant to Section 13263 and 13267 of the California Water Code, Barrel Ten Quarter Circle Land Company doing business as Barrel Ten Quarter Circle, Escalon Cellars, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted there under, shall comply with the following:

Note: Other prohibitions, conditions, definitions, and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.

A. Discharge Prohibitions:

1. Discharge of wastes, including irrigation tailwater, to surface waters or surface water drainage courses is prohibited.

2. Operation of a distillery at the facility is prohibited.

3. Bypass or overflow of untreated or partially treated waste is prohibited.

4. Discharge of waste classified as 'hazardous,' defined in Section 20164 of Title 27, CCR, or 'designated', as defined in Section 13173 of the CWC, is prohibited.

5. The discharge of wastewater in a manner other than as described in the findings is prohibited.

6. The discharge of domestic wastewater to the winery wastewater treatment system is prohibited.

7. The discharge of winery wastewater to a domestic wastewater treatment system (septic system) is prohibited.

8. The discharge of domestic wastewater to the stormwater basin is prohibited. Discharge of stormwater originating in the winery not consistent with the *Stormwater Pollution Prevention Report* (SWPPR) to the basin is prohibited.

9. The direct discharge of wastewater to the tailwater basin or the stormwater basin is prohibited.

B. Discharge Specifications:

1. The monthly average discharge to the LAAs shall not exceed 160,000 gallons per day and an annual total of 48,000,000 gallons of wastewater or stormwater mixtures.

2. Stormwater discharged to the stormwater basin shall not have an electrical conductivity value greater than 500 umhos/cm. Before initiating use of the stormwater basin, the Discharger shall have submitted a Stormwater Pollution Prevention Plan to the Regional Board for approval and received authorization from the Executive Officer to proceed. The Stormwater Pollution Prevention Plan shall include all elements set forth in Order No. 97-03-DWQ, Discharges of Storm Water Associated with Industrial Activities, Section A: Storm Water Pollution Prevention Plan Requirements, as amended or reissued by the State Water Board ("Section A"). However, if the Discharger files a Notice of Non-Applicability, the Discharger is not required to comply with Item 10 of Section A, or any other provisions of Section A that the Executive Officer determines are inapplicable to the discharge.

3. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution as defined by the CWC, Section 13050.

4. The discharge shall not cause the degradation of any groundwater.

5. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.

6. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the property owned by the Discharger.

7. Sufficient dissolved oxygen must be maintained in the upper zone (one foot) of any stormwater or tailwater basin in order to prevent objectionable odors.

8. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge.

9. All basins shall be managed to prevent the breeding of mosquitoes. In particular,
    a. An erosion control program shall assure that small coves and irregularities are not created around the perimeter of the waste surface.
    b. Weeds shall be minimized through control of water depth, harvesting, and/or herbicides.
    c. Algae, vegetation, and debris shall not accumulate on the water surface.

10. The LAAs shall be managed to prevent the breeding of mosquitoes.

11. The wastewater treatment and land application system shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

12. No physical connection shall exist between wastewater piping and any domestic water supply, domestic/industrial supply well, irrigation water pipeline, or irrigation canal without an air gap or approved reduced pressure device.

13. The freeboard in the tailwater basin shall never be less than two feet, as measured vertically from the water surface to the lowest point of overflow.

14. The wastewater treatment and land application system shall have sufficient capacity to accommodate wastewater flow and seasonal precipitation. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

15. On or about **15 October** each year, available tailwater basin storage capacity shall at least equal the volume necessary to comply with Discharge Specifications No. 13 and No. 14.

16. Storage of pomace and/or diatomaceous earth on areas not equipped with means to prevent stormwater infiltration, or a paved leachate collection system is prohibited.

17. Application of pomace and/or diatomaceous earth to LAAs at the winery is prohibited.

18. All water softening ion exchange regeneration brine shall be separated from the wastewater system and disposed of at East Bay Municipal Utility District or a similar facility.

C. Effluent Limitations:

1. Wastewater applied to land shall not exceed the following monthly average effluent limits, or other concentrations as determined in accordance with Provision G.1.g and G.1.h to ensure compliance with the Groundwater Limitations:

		Concentration Limits			
Constituent	Units	4/23/09	2/1/11	2/1/12	2/1/13
Fixed Dissolved Solids	mg/L	2,000	1,500	1,200	750

2. Wastewater applied to land shall not exceed the following loading rates, or other loading rates as determined in accordance with Provision G.1.g and G.1.h to ensure compliance with the Groundwater Limitations:

Constituent	Units	7-day Average [1]
BOD	lbs/ac•day	500

[1] The 7-day average represents the total loading rate divided by 7. LAAs shall rest at least 7 days between wastewater applications.

3. Wastewater discharged to the LAA shall not have a pH of less than 4.5 or greater than 10.0.

D. Land Application Area Requirements:

1. The discharge shall be distributed uniformly on adequate acreage in compliance with the Discharge Specifications and Effluent Limitations.

2. Crops shall be grown on the LAAs. Crops shall be selected based on nutrient uptake capacity, tolerance to high soil moisture conditions, consumptive use of water, and irrigation requirements. Cropping activities shall be sufficient to take up the nitrogen applied, and crops shall be harvested and removed from the land at least on an annual basis.

3. Neither pomace nor DE shall be stored on unpaved ground. Acceptable alternatives include storage on the Pomace/DE pad, paved areas that are equipped with liquid collection systems, or other alternatives that prevent generation of leachate such as roofed areas or use of ag bags for well drained materials.

4. Discharge of wastewater, including runoff, spray or droplets from the irrigation system, shall not occur outside the boundaries of the approved LAA(s). Wastewater application using sprinklers, flood, or drip irrigation is acceptable if the discharge complies with all requirements of this Order.

5. Hydraulic loading of wastewater and irrigation water shall be at reasonable agronomic rates designed to minimize the percolation of wastewater and irrigation water below the root zone (i.e., deep percolation).

6. Wastewater conveyance lines shall be clearly marked as such. Wastewater controllers, valves, etc. shall be affixed with reclaimed water warning signs; quick couplers and sprinkler heads shall be of a type, or secured in such a manner, that permits operation by authorized personnel only.

7. Irrigation systems shall be labeled as containing reclaimed wastewater. If wastewater and irrigation water utilize the same pipeline, then backflow prevention devices shall be installed to protect the potable/irrigation water supply.

8. Application of wastewater to the LAA using sprinkler irrigation is prohibited when wind velocities exceed 30 miles per hour.

9. Public contact with wastewater shall be precluded through such means as fences, signs, and/or irrigation management practices. Signs with proper wording of sufficient size shall be placed at areas of access and around the perimeter of the LAA(s) to alert the public of the use of wastewater.

10. The LAA shall be managed to prevent breeding of mosquitoes. More specifically:

a. All applied water must infiltrate completely within 24 hours.

b. Ditches not serving as wildlife habitat shall be maintained free of emergent, marginal, and floating vegetation.

c. Low pressure pipelines, unpressurized pipelines, and ditches that are accessible to mosquitoes shall not be used to store wastewater.

11. A 50-foot buffer zone shall be maintained between any watercourse and the wetted area produced during irrigation used for wastewater disposal.

12. A 50-foot buffer zone shall be maintained between any industrial, domestic, or irrigation well and the wetted area produced during wastewater application.

13. Discharges to LAAs shall be managed to minimize both erosion and runoff from the irrigated area.

14. A berm shall be maintained around the exterior perimeter of the land application areas to prevent wastewater/stormwater runoff.

15. The resulting effect of the wastewater discharge on the soil pH shall not exceed the buffering capacity of the soil profile and shall not cause significant mobilization of soil constituents such as iron and manganese.

16. Application of wastewater to the LAA via flood irrigation shall only occur on furrows graded or irrigation checks configured so as to achieve uniform distribution, minimize ponding, and provide for tailwater control. Furrow runs and irrigation checks shall be no longer and slopes shall be no greater than what permits reasonably uniform infiltration and maximum practical irrigation efficiency.

17. Wastewater application areas shall be allowed to dry for at least 7 days from the end of wastewater application before the next wastewater application.

18. There shall be no standing water in the LAA 24 hours after wastewater is applied, except during periods of heavy rains sustained over two or more consecutive days.

E. Solids/Sludge Disposal Requirements:

1. Collected screenings, sludge, and other solids removed from winery wastewater shall be disposed of in a manner that is consistent with Title 27, Division 2, Subdivision 1 of the CCR and approved by the Executive Officer.

2. Winery sludge and other solids shall be removed from sumps, screens, etc. as needed to ensure optimal operation and adequate hydraulic capacity. Winery solids drying operations if any, shall be designed and operated to prevent leachate generation.

3. Storage and disposal of domestic wastewater sludge (septage) shall comply with existing Federal, State, and local laws and regulations, including permitting requirements and technical standards.

4. Sludge and other solids shall be removed from septic tanks as needed to ensure optimal operation and adequate hydraulic capacity. A duly authorized carrier shall haul sludge, septage, and domestic wastewater.

5. Any proposed change in solids use or disposal practice from a previously approved practice shall be reported to the Executive Officer at least 90 days in advance of the change.

F. Groundwater Limitations:

1. The discharge, in combination with other sources, shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than background water quality. Monitoring well MW-1 provides background groundwater conditions for the southern portion of the facility, while monitoring well MW-6 provides background groundwater conditions for the northern portion of the facility. Background groundwater quality shall be calculated using the methods provided in Title 27 as described in Provision G.1.e. Background values must be updated annually as described in the MRP.

G. Provisions:

1. All of the following reports shall be submitted pursuant to CWC Section 13267, and prepared by a California registered professional as described in Provision G.2.

   a. By **28 July 2009**, the Discharger shall either apply for coverage or submit a Notice of Non-Applicability for Order No. 97-03-DWQ, Discharges of Storm Water Associated With Industrial Activities.

   b. By **28 July 2009**, the Discharger shall prepare and implement an *Operation and Management Plan* (*O&M Plan*) that addresses operation of the wastewater treatment and disposal system. At a minimum, the *O&M Plan* will describe: (a) the daily operation and maintenance of the treatment system, (b) the practices used to treat the wastewater within limits specified in this Order, (c) the locations of the LAAs, and procedures to prevent excessive BOD, nitrogen, or dissolved solids loading of LAAs, (d) the locations of flow and sampling points, (e) quality control sampling procedures necessary to obtain representative samples, (f) practices used to maintain the LAAs, (g) the locations of the solid waste disposal areas, methods of disposal, and the daily practices associated with the disposal of the solid waste, (h) means to secure and control wastewater from discharging off-site (e.g., installation of fencing or notification signs, installation of berms to prevent runoff, reconfiguration of checks to improve application rates). The plan shall be updated annually until the facility expansion is complete. A copy of the *O&M Plan* shall be kept at the facility for reference by operating personnel and they shall be familiar with its contents.

   c. By **28 July 2009**, the Discharger shall submit a *Crop Uptake and Assimilative Capacity (CUAC) Workplan* to develop site specific loading rates that will be protective of groundwater quality. The CUAC Workplan shall assess the capacity

of the site to treat, remove, or otherwise assimilate wastewater constituents, primarily FDS and nitrogen. The workplan shall include a discussion of the fate and transport of wastewater constituents, and provide a means to determine loading rates that are protective of groundwater quality. The workplan shall include a schedule that includes two years of field testing in the LAAs. Any numerical model that will be used in the study shall be documented as described in the Regional Water Board's guidance available at: *http://www.waterboards.ca.gov/centralvalley/plans_policies/guidance/ modeling.pdf*

d. **At least 90 days before initiating use of the stormwater basin**, the Discharger shall submit a *Stormwater Pollution Prevention Report* (SWPPR) that describes how the facility will be operated to prevent wastewater or wastewater/stormwater mixtures from being discharged to the stormwater basin. The report shall include a description of equipment designed to prevent such discharges.

    i. If implementation of the SWPPR is not effective in preventing wastewater constituents from being discharged to the Stormwater basin, then upon request of the Executive Officer, the Discharger shall either discontinue use of the basin or line the basin with a synthetic liner to minimize infiltration of waste constituents. The MRP requires an annual evaluation of the Stormwater basin status.

e. By **21 August 2009**, the Discharger shall submit a *Background Groundwater Quality Standard Report*. The report shall present a summary of all monitoring data (including data obtained prior to adoption of this Order) and calculation of the concentration in background monitoring wells MW-1 and MW-6, for the constituents listed in Finding No. 48 of the WDRs. This determination of background groundwater quality shall be made using the methods described in Title 27, Section 20415(e)(10), and shall be based on data from at least 12 consecutive groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare the measured concentration in each compliance monitoring well with the proposed background concentration.

f. By **19 November 2009**, the Discharger shall submit a *Potential Conduit Report* on the construction of production, fire-fighting, and domestic wells at the facility. The report shall include construction details, an evaluation of well conditions, and an evaluation of the potential for the wells to act as conduits for degraded quality groundwater to migrate to deeper aquifer zones. If construction details are not available, the well construction shall be investigated using a video-log or similar method. If the investigation reveals a potential for any well to act as a conduit, the Discharger shall submit a Well Abandonment Workplan within **90 days of submittal of the Potential Conduit Report** and a Well Destruction Completion Report within **90 days of submittal of the Well Abandonment Workplan**.

g. By **26 October 2011**, the Discharger shall submit a *Facility Upgrade Workplan* that includes the following:

    i. An Antidegradation Study in accordance with State Water Board Resolution 68-16 (The Antidegradation Policy), the Basin Plan's Antidegradation

Implementation Policy, and the Basin Plan's Policy for Application of Water Quality Objectives.

ii. The Results of the CUAC Study, including documentation of any groundwater models as described in Provision G.1.c. The CUAC Study shall provide support for determination of sustainable wastewater constituent loading rates that will not result in groundwater quality degradation including a sustainable crop uptake rate of FDS. Results of the CUAC Study will be used to establish final effluent limits as presented in Effluent Limitations C.1, C.2. and C.3.

iii. A design for wastewater source control, treatment, and/or segregation, including reductions of FDS that will allow the Discharger to comply with State Board Resolution No. 68-16.

iv. An Implementation Schedule for completing the work described above.

v. Prior to implementation of the Facility Upgrade Workplan, the Discharger shall obtain approval by the Executive Officer.

h. By **26 November 2012**, the Discharger shall submit a *Facility Improvement Report* that describes completion of the improvements described in the *Facility Upgrade Workplan*. The *Facility Improvement Report* shall compare the wastewater quality to the sustainable loading rates determined in Provision G.1.g.ii. If appropriate and protective of groundwater quality, the Discharger may request the effluent limit set in Effluent Limitations C.1, C.2, and/or C.3 be revised through a public hearing of the Regional Water Board.

2. In accordance with California Business and Professions Code Sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.

3. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2009-_____, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

4. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

5. In the event of any change in control or ownership of the facility or wastewater disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator

must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

6. The Discharger shall submit to the Regional Water Board on or before each compliance report due date the specified document, or if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is reported, then the Discharger shall state the reasons for noncompliance and shall provide a schedule to come into compliance.

7. The Discharger shall report to the Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to Section 313 of the “Emergency Planning and Community Right to Know Act of 1986.”

8. The Discharger shall report promptly to the Board any material change or proposed change in the character, location, or volume of the discharge.

9. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or recession of this Order.

10. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

11. The Regional Water Board will review this Order periodically and will revise requirements when necessary.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 4/5 February 2009.

PAMELA C. CREEDON, Executive Officer

TRO: 4/2/09