INFORMATION SHEET

ORDER R5-2012-__
WOODBRIDGE WINERY
WASTEWATER TREATMENT AND LAND BASED DISCHARGE
SAN JOAQUIN COUNTY

Facility Description

Constellation Brands U.S. Operations Inc. dba Woodbridge Winery owns and operates a wine processing facility located at 5950 E. Woodbridge Road, Acampo in San Joaquin County. The facility comprises approximately 202 acres and is located adjacent to and extending north of the Mokelumne River. The property has been used for a variety of winery operations since 1933. Order 87-184, adopted by the Central Valley Water Board on 23 October 1987, prescribes waste discharge requirements for the facility. On 29 September 2010, a Report of Waste Discharge (RWD) was submitted by the Discharger to allow an increase of wastewater treatment and land application as a result of planned expansion of winery production activities at the facility. The Discharger submitted additional information on 29 October 2011 and 22 December 2011.

Winery activities include receiving grapes or grape juice, crushing grapes, fermenting, blending, storing, aging, bottling, and shipping wine. The facility also receives bulk wine in tanker trucks that is blended, stored, bottled on-site, or shipped offsite via tanker trucks. Wastewater is generated during tank, barrel, piping, equipment, and other cleaning activities. Wastewater generally consists of equipment wash water, cellar wash water, spent regenerant from water softening ion exchange units, cooling tower blowdown, bottling wash water, and storm water that falls on uncovered processing areas where it mixes with wastewater. Winery wastewater is typically high in total dissolved solids (TDS), fixed dissolved solids (FDS), biochemical oxygen demand (BOD), and nitrogen. Domestic wastewater is discharged to a septic tank and leachfield system.

In 1987, the Discharger's wastewater treatment system consisted of solid separation, aeration ponds, and 87 acres of Land Application Areas (LAAs), where 57 acres were cropped with grapes. The allowable 30-day average daily dry weather wastewater discharge flow in Order 87-184 is 0.25 million gallons per day (mgd). Since that time, the Discharger has completed several operational upgrades, including completion of a new wastewater treatment system and LAA improvements to accommodate increased winery production.

Current Wastewater Process and Land Application Areas

Current facility operations involve crushing approximately 100,000 to 150,000 tons of grapes per year. The Discharger has recently completed facility upgrades to accommodate increased grape crushing up to 200,000 tons per year. Process wastewater generated at the facility is currently 0.143 mgd, which corresponds to approximately 52 million gallons per year (Mgal/year). Upon approval of the revised WDRs, planned winery expansion will result in wastewater generation of 0.274 mgd, which equates to approximately 100 Mgal/year.

The highest wastewater flows are expected during grape crushing activities, which are generally conducted between September and December. The improved wastewater treatment process includes the use of two 700,000 gallon holding tanks to provide hydraulic and concentration equalization control. Wastewater is then routed through a Mobilized Film Technology (MFT) treatment system to provide a high rate anaerobic process and a Dissolved Air Floatation (DAF) system to remove suspended solids.

Treated wastewater is then directed to three 3.3 million gallon aeration ponds (Upper Ponds) to oxidize the anaerobic system effluent. The Upper Ponds are equipped with brush aerators and dissolved oxygen probes to optimize aerator operation. The Upper Ponds are double-lined with high density polyethylene (HDPE) and have leak detection systems. Solids from both the anaerobic and aerobic processes either settle in the Upper Ponds or are removed and disposed of to a permitted composting operation, delivery for livestock feed, or for further processing at appropriately permitted facilities. Effluent from the Upper Ponds is further treated by filtration as needed to prevent clogging sprinkler irrigation of the LAAs.

Storm water that falls on processing areas is directed to the wastewater system. When combined storm water and wastewater flow rates are above 1,100 gallons per minute (gpm), the combined discharge is directed to a series of unlined Lower Ponds, which are located adjacent to the Mokelumne River. The Lower Ponds provide a total of 23 million gallons of storage capacity. The RWD estimates 9.7 million gallons of storm water will be added in a normal rainfall year and 20.4 million gallons will be added in a 100-year, 365-day precipitation event.

The Discharger currently applies treated wastewater to 75 acres of cropped land for use as LAAs. The Discharger proposes to expand the LAAs to include approximately 101 acres of cropped land. Supplemental irrigation water will be necessary to maintain adequate water to meet the crop demand during the growing season (April, May, June, July, August, September, and October). Supplemental irrigation water will be provided by the on-site irrigation wells and Mokelumne River water. The agricultural irrigation wells produce water that varies in TDS concentration from 250 mg/L to 433 mg/L and averages 343 mg/L. Mokelumne River water averages approximately 60 mg/L.

Wastewater Characterization and Salinity Reduction Efforts

Wastewater discharge activities has been monitored in accordance with Order 87-184, while periodic sampling and analysis of treated wastewater effluent began before portions of the expanded treatment system was installed and began operation in 2008. These data indicate that the Discharger's salinity reduction efforts have not significantly reduced Fixed Dissolved Solid (FDS) concentrations, which were an average mean concentration of 1,171 milligrams per Liter (mg/L) in 2007 as compared to 1,006 mg/L in 2010. In contrast, BOD concentrations have decreased markedly from 4,058 mg/L in 2007 to 53 mg/L in 2010. Since July 2009, approximately 24,000 gallons per year of regeneration brine from water softeners have been captured and disposed of off-site, representing a 60% reduction in total ion exchange brine generated during winery operations.

The Discharger has estimated the average total nitrogen concentration in wastewater to be 20 mg/L. Based on the anticipated average annual wastewater flow rate (100 Mgal), approximately 16,680 pounds/year of total nitrogen will be applied (165 lbs/ac/year). A Crop Uptake and Assimilative Capacity report indicated that for LAA acreage, doubled cropped with alfalfa, Sudan grass, and/or triticale grass, nitrogen uptake rates were determined to be approximately 360 lbs/ac/year. Therefore, proposed nitrogen loading rate is unlikely to degrade groundwater quality. Because the Crop Uptake and Assimilative Capacity report did not consider potassium, which is a key waste constituent due to sodium reduction efforts, it is appropriate to require the Discharger to develop and implement a Nutrient Management Plan that considers all macronutrients (i.e., nitrogen, phosphorus, and potassium).

As part of increasing wastewater production at the facility, the Discharger has improved biological treatment of the wastewater and implemented source control to reduce salinity. However, the RWD did not sufficiently characterize current effluent quality to verify salinity reduction. Therefore the amount of salinity reduction achieved has not been quantified.

Groundwater Quality

Cease and Desist Order (CDO) R5-2007-0082 was issued on 22 June 2007, requiring an investigation of groundwater degradation at the facility. As a result, the Discharger currently maintains a network of 14 shallow-interval groundwater monitoring wells at and around the winery facility. The existing monitoring wells are located at strategic locations to provide water quality data from upgradient, cross-gradient, and downgradient of process areas and LAAs. Groundwater consistently flows away from the Mokelumne River to the north-northwest, making the river a losing stream that recharges the shallow groundwater interval.

Average wastewater constituents in groundwater indicate that upgradient monitoring wells MW-1, MW-2, and MW-3 consistently have lower TDS concentrations, as compared to other monitoring wells associated with the facility. Average TDS concentrations in MW-1, MW-2, and MW-3 are 61 mg/L, 288 mg/L, and 138 mg/L, respectively. Groundwater quality downgradient of the LAAs reflect an increase in TDS concentrations as compared to upgradient monitoring well locations. The highest mean TDS concentration between 2001 and 2009 was in 773 mg/L in MW-8. TDS concentrations in the Mokelumne River generally range from 20 mg/L to 50 mg/L. Because groundwater consistently flows away from the Mokelumne River to the north/northwest, the infiltrating river water strongly affects groundwater quality at the facility, providing a continuous supply of high quality (low TDS) groundwater.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage is to Mokelumne River. The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition for The Sacramento River Basin and the San Joaquin River Basin* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. The receiving water for this discharge is groundwater. The applicable

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

Antidegradation

State Water Resources Control Board (State Board) Resolution 68-16 (the Antidegradation Policy) allows the degradation of groundwater quality if the Central Valley Water Board determines that:

- The degradation is consistent with the maximum benefit to the people of the State.
- The degradation will not unreasonably affect present and anticipated future beneficial uses.
- The degradation does not cause exceedance of one or more water quality objectives.
- The discharger employs best practicable treatment and control to minimize degradation.

The following treatment and control practices will be implemented at the site:

- The wastewater will be treated using physical processes to reduce the residual solids.
- The wastewater will be treated using biological processes in the form of an anaerobic digester and pond aerators to reduce BOD. The Upper Ponds are lined and equipped with a leak detection system.
- Approximately 101 acres of LAA will be available for the application of treated wastewater. Crops planted in the LAA will take up the waste constituents found in the wastewater. This Order limits land application of nitrogen to agronomic rates.
- This Order requires the Discharger to prepare a tailwater management plan to prevent ponding or surface water runoff of treated wastewater applied to the LAAs.
- Grape pomace and solid waste generated as part of the wastewater treatment process is presently hauled off-site for reuse or disposal to a permitted landfill.
- This Order requires periodic groundwater and wastewater effluent monitoring.

The WDRs allows the Discharger to blend wastewater with supplemental irrigation water to meet LAA crop demands. Effluent limitations were established as preventive measures to prevent further groundwater degradation. Because the Discharger has not quantified the salinity reduction achieved to date, the WDRs also require implementation of a Salinity Source Control Plan within three years.

Dissolved solids can pass through the treatment process and soil profile; effective control of such constituents relies primarily upon source control and pretreatment measures. If not managed carefully, long-term land discharge of food processing wastewater is likely to degrade groundwater with dissolved solids (as measured by FDS). Source control is an effective means to prevent groundwater degradation by FDS. The Discharger will implement a number of best practicable treatment and control measures to ensure minimal to no impacts on the groundwater including the following:

- The Upper Ponds used for initial wastewater treatment are lined.
- Crops planted in the LAA will take up some of the waste constituents in the treated wastewater;
- Waste solids are separated and hauled off-site for recycling or disposal;
- Operation of a stormwater diversion system for outdoor winery work areas prevents contaminated stormwater discharges.

A discharge of wastewater that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under conditions of low soil pH (below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Overloading the land application areas is preventable. Based on the quality of the wastewater and the amount available for land application, the soil is expected to provide adequate buffering of acidic or basic wastewater.

Effluent Limitations

Effectively immmediately, discharge to the Upper Ponds shall not exceed 15.75 million gallons per calendar month. In addition, the wastewater discharge shall not exceed an annual total of 75 million gallons of wastewater and/or storm water mixtures per calendar year. The annual flow limit can be increased to 100 million gallons upon completion of 25 additional acres of new LAAs and approval by the Executive Officer. Wastewater discharge limits for the LAAs include a daily maximum BOD limit 300 lb/ac/yr, an average annual flow-weighted FDS average of 775 mg/L, and annual average of 300 lbs/ac/year of total nitrogen. Supplemental irrigation water can be used to meet crop demands and to provide dilution.

Groundwater Limitations

Effective immediately, the discharge shall not cause a statistically significant increase in waste constituent concentrations in any compliance monitoring wells. Compliance with this requirement shall be determined annually based on an approved intrawell statistical analysis comparing the well to historic data collected from each well location rather than referring to an upgradient well. Updated values must be calculated annually as described in the MRP.

The Order requires quarterly groundwater monitoring and reporting and submittal of an annual report. The annual report will include a comprehensive evaluation of the effectiveness of the past year's wastewater application operations in terms of odor control and groundwater protection, including consideration of application management practices (e.g., waste constituent and hydraulic loadings, application cycles, drying times, and cropping practices), and groundwater monitoring data. The annual report will also include tabular and graphical summaries of total loading rates for BOD, total nitrogen, and fixed dissolved solids, a description of salinity control methods implemented in the calendar year and a quantification of the reductions achieved as compared to previous years, and a discussion of compliance and corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.