ATTACHMENT F

**NITROGEN ASSESSMENT AND MANAGEMENT PLAN**

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

**SAN FRANCISCO BAY REGION**

For the General Waste Discharge Requirements for

Discharges of Winery Waste to Land Within the San Francisco Bay Region

Order No. R2-2017-Xxx

1. **PURPOSE**

The purpose of the Nitrogen Assessment and Management Plan includes the following:

1. To assess whether the effluent leaving the discharge point (either surface or subsurface discharge) will meet the groundwater nitrate water quality objective of 10 mg/L as nitrogen by the time the effluent reaches the groundwater surface, and
2. To identify practices that the Discharger shall implement to minimize adverse impacts to groundwater from the land application of nitrogen found in winery process wastewater and processing solids.

The Nitrogen Assessment and Management Plan specifies the protective agronomic application rate of winery process wastewater and solids to land, and it documents compliance with the Order requirements.

1. **WHEN IT IS DUE**
2. For facilities that discharge to groundwater impacted by nitrate[[1]](#footnote-1) (i.e., with nitrate concentrations in excess of water quality standards), the Nitrogen Assessment and Management Plan is a required component of the NOI package.
3. If the concentration of nitrate in the discharge from a facility located elsewhere in the Region (i.e., not discharging to a nitrate-impacted groundwater area) exceeds the Numeric Action Level (NAL) for nitrate **three times** during a rolling **12-month period**, the Discharger shall complete a Nitrogen Assessment and Management Plan and submit it with the next quarterly monitoring report submittal. For discharges to areas without vegetative cover, the NAL is 12.5 mg/L nitrate as nitrogen. For discharges to areas with vegetative cover, the NAL is 20 mg/L nitrate as nitrogen.
4. **WHEN AND HOW IT MUST BE UPDATED**
5. The Nitrogen Assessment and Management Plan shall be revised by the Discharger if changes in conditions or practices at the winery require modification of nitrogen management practices. Conditions that may require modification of nitrogen management practices include, but are not limited to, the following:

* Changes in effluent nitrogen concentration,
* Changes in type of crop/vegetation grown,
* Designation of a new land application area, and
* Modification of land application practices to prevent the off-site movement of process wastewater or process solids.

1. Records on the timing and amounts of process wastewater and process solids applied to land shall be collected and submitted in accordance with the Monitoring and Reporting Program (Monitoring Program) associated with the Order (Attachment A).
2. **REQUIRED COMPONENTS**

New facilities (i.e., those facilities that have yet to discharge winery waste and for which monitoring data are not yet available) submitting the Nitrogen Assessment and Management Plan at the time of NOI submittal shall complete the assessment and propose management plans for the proposed discharge. All other facilities shall evaluate their current nitrogen balance as well as proposed changes, as outlined below. At a minimum, the Nitrogen Assessment must contain the following components:

1. **Contact Information**

The name and phone number of

1. Facility owner,
2. Facility operator who is responsible for implementing the Nitrogen Assessment (if different from the owner), and
3. Developer of the Nitrogen Assessment.
4. Copies of any written agreements that authorize the Discharger to apply process wastewater and process solids on property not owned or operated by the Discharger;
5. **Facility and Land Application Area Information**

The following information must be included:

1. Name of the facility,
2. Facility address,
3. Assessor’s Parcel Number(s) for the facility location and land application area,
4. Total acreage of the land application area; and the acreage used for the application of (a) process wastewater, (b) non-hazardous, decomposable, processing solids , or (c) both,
5. Depth to groundwater in the discharge area.
6. **Maps and Drawings**
7. One or more United States Geological Survey quadrangle maps or equivalent showing the location of the facility and the land application area.
8. One or more aerial photos or scaled map drawings showing the entire land application area. The aerial photo(s) and/or drawing(s) of the land application area should include a map legend and identify the locations of all of the following:
   1. Surface water courses, drainage ditches and drainage controls (berms, levees, etc.),
   2. Subsurface (tile) drainage systems and associated discharge points,
   3. Groundwater wells and type (domestic, industrial, agricultural, or monitoring), and
   4. On-site wastewater treatment systems and leach fields.
9. **Current Conditions and Practices--Application**
10. Total annual nitrogen load in **pounds/acre/year** being applied to the land application area from the reuse of process wastewater **and** process solids separately,
11. Average nutrient content and total annual volume of process wastewater and process solids being land applied,
12. Land application method,
13. Method to ensure that the wastewater is evenly spread over the land,
14. Best Management Practices (BMPs) preventing runoff into surface waters, and
15. Wetting and drying cycle durations that reflects the length of time that wastewater is applied to the land and the time in between applications.
16. **Current Conditions and Practices—Uptake, Dilution, and Removal**
17. Annual agronomic nutrient need, of the crop(s) or landscape vegetation grown in the land application area. The *Western Fertilizer Handbook* by the California Plant Health Association is one of many resources that contain information on nutrient uptake rates of crops, including cover crops;
18. Quantity of dilution that will occur through the application of other irrigation water sources, if applicable;
19. Life cycle of the crop or vegetation such as whether growth occurs annually or seasonally and when planting and the stages of growth occur; and
20. The type and area of coverage of crop(s) or vegetation being grown within the land application area.
21. **Mass balance Calculations and Conclusions**
22. Evaluate whether the annual nitrogen agronomic nutrient rate for the crop(s) or vegetation is being exceeded through the land application of the winery process wastewater and solids.
23. Nutrient mass balance that indicates the amount of nitrogen assumed to be applied in a year in comparison to the amount taken up by the biological or physical processes of the crop-soil system.
24. Calculate the effluent nitrate-nitrogen concentration at the groundwater surface and evaluate whether it is meeting the Basin Plan water quality objective of 10 mg/L as nitrogen.[[2]](#footnote-2)
25. **Proposed Conditions and Practices**

The Nitrogen Assessment shall describe how and when process wastewater and solid non‑hazardous, decomposable processor waste will be applied to the land application area(s).

If the nitrogen budget demonstrates that the nutrients generated by the winery exceed the amount needed by crops in the land application area, then the Discharger shall include management practices in the Nitrogen Assessment that will be implemented to prevent impacts to surface water or groundwater due to application of excess nutrients. Such practices may include obtaining access to additional land for nutrient application, additional wastewater treatment, or exporting the solid non-hazardous, decomposable processing waste to a permitted composting facility or landfill.

Dischargers for whom there is an existing discharge shall assess current conditions and then propose management changes that will rectify the exceedance, if the current conditions cause an exceedance.

1. **RECORD-KEEPING AND NITROGEN ASSESSMENT REVIEW**
2. The Discharger shall maintain records for each land application area and use the records as a basis for revisions to the Nitrogen Assessment.
3. All records shall be available for Regional Water Board staff review during inspections.
4. The Discharger shall provide a list of resources and data sources that were used in the Nutrient Assessment.
5. The data shall be reviewed annually and updated if there are any significant changes in conditions or practices at the winery that necessitate changes in the Nitrogen Assessment.
6. The data and calculations may be reviewed by Regional Water Board staff, and the Regional Water Board retains the authority to require revisions and improvements to the Nitrogen Assessment and Management Plan.
7. **Additional Monitoring and Reporting – Applicable to wineries discharging to known nitrate-impacted groundwater areas**

To provide assurance that the calculations provided in support of the Nitrogen Assessment represent the concentration near the groundwater seasonal high water table, one of the following shall be implemented by Dischargers discharging to known nitrate-impacted groundwater areas:

1. Collect a minimum of two sediment pore water samples within five feet of the groundwater seasonal high water table down gradient of the discharge area based on the groundwater flow direction and analyze for nitrate. The samples shall be collected twice during the year to coincide with the crush and non-crush season.

Sediment pore water or interstitial water sampling is most suitable for sediment types ranging from sandy to uncompacted silt-clays. Such sampling is not typically performed on sediments with coarse particle size (such as gravel) or on hard, compacted clays, as the potential for pore water contamination in these sediment types is relatively low.

The sediment samples shall be collected in accordance with the U.S. EPA’s *Methods for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses*.[[3]](#footnote-3)

1. Collect samples of the groundwater from a well located onsite that is completed to a depth that allows for sampling representative of the shallow groundwater down gradient of the discharge area. A properly designed, installed, and developed groundwater monitoring well provides groundwater samples that exhibit the physical and chemical properties of that portion of the aquifer screened by the well. The samples shall be collected twice during the year to coincide with the crush and non-crush season.

If a shallow groundwater monitoring well has not been installed onsite, refer to **Attachment K** *Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports*.

1. Figure 3 in Attachment J of the Order depicts the nitrate-impacted groundwater areas in Alameda County. [↑](#footnote-ref-1)
2. Chapter 3, section 3.4 of the Basin Plan contains the water quality objectives for groundwater, and is accessible online at http://www.waterboards.ca.gov/sanfranciscobay/water\_issues/programs/planningtmdls/basinplan/web/bp\_ch3.shtml#3.4. [↑](#footnote-ref-2)
3. Source: U.S. EPA, 2001. Methods for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual, EPA/823/B-01/002. http://goo.gl/YXPVnJ [↑](#footnote-ref-3)