

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION
MONITORING AND REPORTING PROGRAM NO. ___

FOR
MUSCO FAMILY OLIVE COMPANY AND THE STUDLEY COMPANY
WASTEWATER TREATMENT AND LAND DISPOSAL FACILITY
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring influent wastewater, the wastewater treatment/storage reservoir, effluent wastewater, the land application areas (LAAs), the industrial process water supply, groundwater, and surface water. This MRP is issued pursuant to California Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

Specific sampling locations shall be approved by Central Valley Water Board staff prior to sampling activities. All samples shall be representative of the volume and nature of the discharge or the material sampled, as applicable. The time, date, and location of each grab sample shall be recorded on the sample container and chain of custody form.

Field test instruments (such as those used to measure pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. At a minimum, the instruments are field-calibrated at least at the manufacturer's recommended frequency;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

INFLUENT WASTEWATER MONITORING

The Discharger shall monitor influent wastewater in accordance with the following. Samples shall be representative of the influent to the wastewater treatment/storage reservoir. Influent samples shall be collected downstream of the screen and prior to discharge to the wastewater treatment/storage reservoir. The Discharger shall use its existing continuous recording devices to monitor influent flow rate, pH, and electrical conductivity. Otherwise, grab samples collected from a pipeline or sump will be considered representative. Influent monitoring shall include, at a minimum, the following:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Influent flow ¹	gpd	Meter Observation	Continuous	Monthly
Electrical Conductivity	umhos/cm	Meter Observation	Continuous ²	Monthly
BOD ₅ ³	mg/L, lbs/day	Grab	Weekly	Monthly
Total Suspended Solids	mg/L	Grab	Weekly	Monthly
Fixed Dissolved Solids	mg/L	Grab	Weekly	Monthly
Sodium	mg/L	Grab	Weekly	Monthly
Chloride	mg/L	Grab	Weekly	Monthly

¹ Flow of process wastewater and storm water from the facility (does not include tailwater return flows or storm water from the land application area).

² Report daily minimum, maximum, and mean.

³ 5-day, 20 °C biochemical oxygen demand.

WASTEWATER TREATMENT/STORAGE RESERVOIR MONITORING

Samples shall be collected from the wastewater treatment/storage reservoir whenever water is present. Samples shall be collected from an established sampling station as far as practical from the pond inlet, and in an area which will provide a sample representative of the wastewater in the pond. Samples for dissolved oxygen and pH shall be collected at a depth of 1 to 2 feet below the pond surface. Pond monitoring shall include at least the following:

Parameter	Units	Sample Type	Sampling Frequency	Reporting Frequency
Freeboard ¹	feet	Measurement	Weekly	Monthly
Dissolved Oxygen	mg/L	Grab	Daily ²	Monthly
pH	s.u.	Grab	Daily ²	Monthly
Aerator Operations Status ³	--	Observation	Daily	Monthly
Reservoir Condition ⁴	--	Observation	Daily ²	Monthly

¹ To be measured from the water surface vertically to the lowest possible point of overflow.

² This parameter shall be monitored daily for five days in each calendar week.

³ Aerator status monitoring shall include daily observation of the number of aerators in operation, the time period during which each aerator was operated, and the total hours of operation for each aerator

- ⁴ Pond condition monitoring shall include determination of dam condition, storm water diversion ditches, wastewater overflows, and odor conditions (none, slight, moderate, strong).

EFFLUENT WASTEWATER MONITORING

Effluent wastewater samples shall be collected from the wastewater treatment/storage reservoir, from the approximate depth and location from which wastewater is discharged for land application or from a discharge pipe that conveys treated wastewater to the LAA irrigation system. Samples shall be collected and analyzed at the following frequencies during periods of land application. Effluent monitoring shall include at least the following:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Electrical Conductivity	umhos/cm	Grab	Daily ¹	Monthly
PH	s.u.	Grab	Daily ¹	Monthly
BOD ₅	mg/L	Grab	Weekly	Monthly
Nitrate Nitrogen	mg/L	Grab	Weekly	Monthly
Total Kjeldahl Nitrogen	mg/L	Grab	Weekly	Monthly
Fixed Dissolved Solids	mg/L	Grab	Weekly	Monthly
Chloride, Dissolved	mg/L	Grab	Weekly	Monthly
Sodium, Dissolved	mg/L	Grab	Weekly	Monthly
Iron, Dissolved	mg/L	Grab	Monthly	Monthly
Bicarbonate, Dissolved	mg/L	Grab	Monthly	Monthly
Sulfate (as SO ₄), Dissolved	mg/L	Grab	Monthly	Monthly
General Minerals ²	mg/L	Grab	Quarterly	Quarterly

¹ This parameter shall be monitored daily for five days in each calendar week.

² Including carbonate, calcium, manganese, magnesium, potassium, boron, and cation/anion balance.

LAND APPLICATION AREA MONITORING

Application of wastewater to each of the land application areas shall be monitored in accordance with the following. The Discharger shall maintain a sufficient number of flow meters to continuously monitor the flow of wastewater to each of the land application areas. All meters shall be calibrated annually in accordance with Standard Provision C.4.

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Precipitation	inches	Measured ¹	Daily	Monthly
Flow to Land Application Area	gpd	Metered/Calculated	Daily	Monthly
Application Area	acres	Measured	Daily	Monthly
Crop Cover Status	percent coverage	Calculated	Quarterly	Quarterly ²
BOD ₅ Loading Rate	lbs/acre/day	Calculated ³	Daily	Monthly
Hydraulic Loading Rate	inches/month	Calculated	Monthly	Monthly
Total Nitrogen Loading Rate	lbs/acre/month	Calculated ⁴	Monthly	Monthly

¹ As measured and reported at California Irrigation Management Information System (CIMIS) Station No. 167 or other approved station.

² Results shall be reported in the Monthly Monitoring Report submitted for the last month of the calendar quarter.

³ BOD₅ loading shall be calculated for each LAA using the daily applied volume of wastewater, estimated daily application area, daily tailwater return flow, and the most recent results of effluent and tailwater BOD₅.

⁴ Total nitrogen loading rates shall be calculated for each LAA as a flow-weighted mass using the daily applied volume of wastewater, estimated daily application area, daily tailwater return flow, and the most recent results of effluent and tailwater total nitrogen.

In addition, the Discharger shall maintain a daily log of discharges to the land application area. Notations shall record which area is receiving wastewater, observations of ponding water, saturated soil, odors, insects, or other potential nuisance conditions. The notations shall also document any corrective actions taken.

The Discharger shall record and submit, as part of the monthly self-monitoring reports, information describing what soil amendments, including fertilizer, were applied to the land application areas, why the amendment was applied, the quantity of amendment used (total pounds applied and pounds per acre, and a description of the area over which it was used (i.e., field names, acreage).

PROCESS WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the process water supply can be obtained. If the water supply is from more than one source, the monitoring report shall report the constituent results as a flow-weighted average and include copies of supporting calculations. Water supply monitoring shall include at least the following:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Total Dissolved Solids	mg/L	Grab	Annually	Annually
Fixed Dissolved Solids	mg/L	Grab	Annually	Annually
General Minerals	mg/L	Grab	Annually	Annually

¹ Including chloride, sulfate, bicarbonate, carbonate, calcium, iron, manganese, magnesium, potassium, sodium, boron, nitrate nitrogen, alkalinity series, hardness, and cation/anion balance.

GROUNDWATER MONITORING

Effective immediately, the Discharger shall monitor all groundwater monitoring wells listed in Waste Discharge Requirements Order No. ___. **Effective during the first quarter following the Executive Officer's approval of the *Groundwater Limitations Compliance Assessment Plan***, the Discharger shall monitor all wells identified as background and compliance monitoring wells in the approved *Groundwater Limitations Compliance Assessment Plan*. Prior to completion of any new or replacement groundwater monitoring wells, the Discharger shall submit plans and specifications to the Central Valley Water Board for review and approval. Once installed, all new or replacement wells shall be added to the list of background and compliance monitoring wells.

In addition, as long as the property owners grant access, samples shall be collected from the domestic well located at 26933 South Hansen Road, Tracy, and the stock watering well located to the west of the 95-acre field in Assessor's Parcel Number 251-32-006 in Tracy. Samples from this well shall be collected upstream of any water treatment equipment.

Prior to sampling or purging of a well, equilibrated groundwater elevations shall be measured to the nearest 0.01 foot from a reference point surveyed to the nearest 0.01 foot in elevation. Groundwater depths shall be measured in all wells on the same day. Prior to collection of a groundwater sample, each shall be purged at least three well volumes until pH and electrical conductivity have stabilized, and a sample representative of the water-bearing zone can be collected. Groundwater sample collection shall be coordinated with that required by WDRs Order No. R5-2005-0024, and subsequent revisions thereto, and shall take place on the same dates. Sample collection shall follow standard U.S. EPA protocols. Groundwater monitoring shall include, at a minimum, the following:

Constituent	Units	Sample Type	Sampling Frequency ¹	Reporting Frequency
Depth to Groundwater ²	0.01 ft	Measurement	Quarterly/Semi-Annually	Quarterly
Groundwater Elevation ²	0.01 ft	Calculated	Quarterly/Semi-Annually	Quarterly
Gradient ²	ft/ft	Calculated	Quarterly/Semi-Annually	Quarterly

Constituent	Units	Sample Type	Sampling Frequency ¹	Reporting Frequency
Gradient Direction ²	degrees	Calculated	Quarterly/Semi-Annually	Quarterly
pH	s.u.	Grab	Quarterly/Semi-Annually	Quarterly
Total Dissolved Solids	mg/L	Grab	Quarterly/Semi-Annually	Quarterly
Ammonia nitrogen	mg/L	Grab	Quarterly/Semi-Annually	Quarterly
Nitrate nitrogen	mg/L	Grab	Quarterly/Semi-Annually	Quarterly
General Minerals ³	mg/L	Grab	Quarterly/Semi-Annually	Quarterly

¹ Onsite wells shall be sampled quarterly, and offsite wells shall be sampled semiannually during the second and fourth calendar quarters.

² Not required for stock watering, K-1, and Hansen Road wells. For these wells, measurement of at least depth to groundwater is required unless well head construction or the well owner prohibits it.

³ Includes chloride, sulfate, bicarbonate, carbonate, calcium, iron, manganese, magnesium, potassium, sodium, boron, and cation/anion balance.

SURFACE WATER MONITORING

Surface water samples shall be collected from sampling locations SW-1, SW-2, SW-3, and SW-4 as shown on Attachment C and analyzed in accordance with the following:

Constituent	Units	Sample Type	Sampling Frequency ^{1, 2}	Reporting Frequency
Fixed Dissolved Solids	mg/L	Grab	Monthly	Monthly
BOD ₅	mg/L	Grab	Monthly	Monthly
Turbidity	NTU	Grab	Monthly	Monthly
Electrical Conductivity	umhos/cm	Grab	Monthly	Monthly
pH	s.u.	Grab	Monthly	Monthly
Ammonia nitrogen	mg/L	Grab	Monthly	Monthly
Nitrate nitrogen	mg/L	Grab	Monthly	Monthly
Total Alkalinity	mg/L	Grab	Monthly	Monthly
Chloride, Dissolved	mg/L	Grab	Monthly	Monthly
Iron, Dissolved	mg/L	Grab	Monthly	Monthly
Sodium, Dissolved	mg/L	Grab	Monthly	Monthly
Sulfate (as SO ₄)	mg/L	Grab	Monthly	Monthly

¹ Samples shall be collected within three days after the first significant rainfall after 1 September each year.

² Samples shall be collected monthly from December through April when flowing water is present.

LAND APPLICATION AREA SOILS MONITORING

The Discharger shall collect and analyze representative soil samples at the background and LAA soil monitoring locations shown on Attachment D in accordance with the following. Samples shall be collected and composited to create a sample representative of the following intervals at each sampling location: 0 to 6 inches bgs, 19 to 30 inches bgs, and 46 to 60 inches bgs. Sampling shall be performed annually in September and analytical methods using saturated paste extract shall be employed to be consistent with analysis of historical samples.

Constituent	Units	Sampling Frequency	Reporting Frequency
Bicarbonate	mg/L	Annually	Annually
Carbonate	mg/L	Annually	Annually
Calcium	mg/L	Annually	Annually
Chloride	mg/L	Annually	Annually
Iron, dissolved	mg/L	Annually	Annually
Sodium	mg/L	Annually	Annually
Magnesium	mg/L	Annually	Annually
Potassium	mg/L	Annually	Annually
Sulfate (as SO ₄)	mg/L	Annually	Annually
Sodium Adsorption Ratio	unitless	Annually	Annually
Electrical Conductivity	umhos/cm	Annually	Annually
pH	s.u.	Annually	Annually
Exchangeable Sodium Percentage	%	Annually	Annually
Nitrate nitrogen	mg/L	Annually	Annually
Total Kjeldahl nitrogen	mg/L	Annually	Annually

SOIL MOISTURE MONITORING

The Discharger shall monitor soil moisture at the soil moisture monitoring locations depicted on Attachment F, which is attached hereto and forms part of this Order. Moisture measurements shall be obtained quarterly at 4-inch increments from the ground surface to a depth of five feet. Soil moisture monitoring results shall be aggregated at 12-inch intervals for each sampling location. All monthly soil moisture monitoring results shall be reported as inches of water and percent saturation in the Annual Monitoring Report.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, soil, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required by the Monitoring and Reporting Program, shall be reported in the next scheduled monitoring report.

With the exception of flow, all constituents monitored on a continuous basis shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a California Registered Engineer or Geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Central Valley Water Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include the following. Monitoring data shall be presented in tabular format.

1. Results of influent wastewater, wastewater ponds, effluent wastewater, land application areas, and surface water monitoring.
2. A map of all LAAs showing field names.
3. The location of each meter used to record flow, pH, and electrical conductivity.
4. Calibration records for all meters used to obtain monitoring data.
5. Calculation of the following:
 - a. The monthly average FDS concentration of effluent discharged to the wastewater treatment/storage reservoir;
 - b. The total volume of effluent discharged to the wastewater treatment/storage reservoir for the month;
 - c. The average daily flow of effluent discharged to the wastewater treatment/storage reservoir;
 - d. The mass of FDS discharged to the wastewater treatment/storage reservoir for the month; and
 - e. The cumulative FDS mass discharged to the wastewater treatment/storage reservoir to date for the calendar year.

6. A comparison of monitoring data to the limitations in WDRs; an explanation of any violation of those requirements; and a specific plan to correct the conditions that caused the violations if such conditions have not already been corrected. This comparison shall include certification of compliance with all discharge prohibitions and specifications.
7. If requested by staff, copies of laboratory analytical reports.

B. Quarterly Monitoring Reports

The Discharger shall establish a quarterly sampling schedule for groundwater monitoring such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Central Valley Water Board by the **1st day of the second month after the quarter** (i.e., the January-March quarterly report is due by May 1st). The Quarterly Monitoring Report shall verify that the Discharger has performed the required groundwater sampling and analysis for the calendar quarter in compliance with the WDRs, this MRP, and the Standard Provisions and Reporting Requirements. The report shall include a list of the monitoring wells sampled, the dates of sampling, the name of the analytical laboratory, a list of the analyses requested, the date(s) that the samples were received by the laboratory, and documentation showing that the samples were received in good condition and within the required sample holding times.

C. Annual Monitoring Report

An Annual Monitoring Report shall be prepared for each calendar year and shall be submitted to the Central Valley Water Board by **1 February** each year. The Annual Monitoring Report shall include the following:

1. The results of groundwater monitoring for all four quarters of the calendar year, including at least:
 - a. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for each monitoring event. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged.
 - b. Calculation of groundwater elevations and determination of groundwater flow direction and gradient on the date of each quarterly monitoring event; comparison of previous flow direction and gradient data; and discussion of seasonal trends if any.

- c. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum for each quarterly monitoring event.
 - d. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).
 - e. A statistical evaluation of monitoring data relative to the groundwater limitations and an explanation of any exceedance of those limitations.
 - f. Summary data tables of historical and current water table elevations and analytical results.
 - g. Copies of laboratory analytical report(s) for groundwater monitoring.
2. The contents of the December Monthly Monitoring Report.
 3. The results of all water supply monitoring.
 4. The results of all surface water monitoring.
 5. A discussion of monitoring of the Class II surface impoundments for excess capacity available to divert higher salinity wastewater from the treatment/storage reservoir to the Class II surface impoundments. Include documentation of periodic assessment of whether the impoundments had excess capacity, the waste streams that were diverted to the surface impoundments, and the estimated volume diverted.
 6. Calculation of the average daily flow for each month (mgd) and the total annual flow (MG) to demonstrate compliance with the flow limits.
 7. Calculation of the monthly average FDS concentration (mg/L) and the total annual FDS mass to demonstrate compliance with the effluent limits.
 8. The results of land application soils monitoring, including a map depicting sample locations and an updated statistical evaluation of salinity trends over time with depth for each LAA.
 9. The results of monthly soil moisture monitoring, and analysis and interpretation of that data with respect to maximizing crop health while minimizing percolation below the crop root zone.
 10. An estimate of the sludge volume in the wastewater treatment/storage reservoir and, if needed to comply with the WDRs, a summary plan and schedule for sludge removal.

11. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
12. An annual report, prepared by a Certified Crop Advisor or Certified Agronomist, detailing the effect of the application of the wastewater on crops, the health of the crops grown at the LAAs, and the potential for increased soil salinity and the resulting impacts to future crop growth. The report shall present the estimated crop coverage for each LAA as of the end of the year, describe the crop conditions throughout the year, and contain recommendations regarding actions necessary to improve the crop health and crop coverage for the following year. The report shall discuss the use of any soil amendments or supplemental fertilizers and the anticipated effects on nitrogen, phosphorus, potassium, chloride, iron, sodium, and sulfate concentrations and mobility within the soil column.
13. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
14. Calibration records for all flow meters.
15. If requested by staff, tabular summaries of all data collected during the year.

A letter transmitting all reports required by this Monitoring and Reporting Program shall accompany each report. The letter shall include a discussion of all violations during the reporting period, and actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective action, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of ___.

PAMELA C. CREEDON, Executive Officer

(date)