



## Process Wastewater (Liquid Manure) Sampling Protocol

Deanne Meyer  
University of California, Davis

In May 2007, the Central Valley Regional Water Quality Control Board (Regional Board) adopted Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies (General Order)<sup>1</sup>. The Monitoring and Reporting Program of the General Order requires analyses of various types of materials to define baseline conditions, develop and implement a Nutrient Management Plan (NMP), and describe potential pollutant load in illegal discharges. The General Order requires dairy operators to sample **liquid manure** and obtain specific laboratory analyses for use in estimating nutrient inputs and outputs by field.

### Part I –Laboratory Selection and Identification of Sampling and Analytical Requirements

1. Select a laboratory that utilizes methods described by the Manure Analyses Proficiency (MAP) Testing Program, California Department of Health Services Environmental Laboratory Analytical Procedures accredited laboratory for wastewater analyses, or alternative methodology accepted by the Central Valley Regional Water Quality Control Board. (Available at their website ([http://www.waterboards.ca.gov/centralvalley/water\\_issues/dairies/sampling\\_procedures.pdf](http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/sampling_procedures.pdf))). Table 1 outlines the constituents and frequency of sampling analysis requirements specified under the General Order. Additional sampling may be necessary to meet the nutrient management plan needs defined in your sampling and analysis plan.

<p><b>Table 1.</b> Nutrient Monitoring for Process wastewater (liquid manure) Analyses (minimum regulatory requirements).</p> <p><b><u>Quarterly during one application event:</u></b> Field or lab measurement of electrical conductivity.</p> <p><b>Laboratory analyses</b> for nitrate-nitrogen (only when retention pond is aerated), ammonium-nitrogen, total Kjeldahl nitrogen, total phosphorus, and potassium.</p> <p><b><u>Once within 12 months and annually for two years after groundwater monitoring wells are required:</u></b> <b>Laboratory analyses</b> for general minerals (calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride).</p>
--

<sup>1</sup>Central Valley Regional Water Quality Control Board. 2007. Order No. R5-2007-0035. Waste Discharge Requirements for General Order for Existing Milk Cow Dairies. Adopted May 3. Available at [http://www.waterboards.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/general\\_orders/r5-2007-0035.pdf](http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2007-0035.pdf).

2. Contact your analytical laboratory to obtain labels, description of preferred sample containers, required record keeping, and chain of custody forms.

## Part II - Sampling Preparation & Location Determination

1. Identify appropriate sampling locations (sampling spigot inserted into a pipeline, location within a sampling box, discharge to standpipe, etc.). Refer to your sampling and analysis plan for this information. A sampling spigot (hose bib or faucet) installed in the side of the pipe makes sampling more convenient.
2. Identify worker safety issues associated with sampling and be sure appropriate protective gear is available.
3. Determine how you will identify your samples (e.g., description of pond source and sample location).
4. Gather sampling equipment needed, e.g., disposable gloves, safety goggles, sample container holder apparatus to allow direct collection of sample into sample bottle, permanent marker, ice and ice chest, labels for sample bottles, chain of custody forms, notebook for record-keeping, and life line if sampling near a liquid manure storage structure or confined space.

## Part III – Sample Collection

1. Label sample bottle with sample site identification (consistent with NMP naming), sampler's name, the date and time of sampling.
2. Put on disposable gloves and safety goggles.
3. Secure sample bottle to sampling device (if using). Insert sample bottle into flowing waste stream. Fill bottle to within ½ inch of top. **DO NOT OVERFILL THE BOTTLE.** If the bottle is overfilled, empty and re-sample.
4. Tighten cap on bottle before placing in ice-cooled chest.
5. For dairies that will do their own field Electrical Conductivity (EC) readings:
  - a. Calibrate probe prior to use.
  - b. Analyze EC after collection and before storing on ice or in refrigeration according to manufacturer instructions.
6. Complete a chain of custody form using the information on the bottle label.
7. Keep a copy of the chain of custody form with sample identification records.
8. Deliver fresh samples to the laboratory within 24 hours of sampling.
9. Request sample analyses necessary for compliance and additional agronomic needs. Compliance requirements are located in Table 1.

*Information in this document was compiled by CDQAP to assist dairy producers in understanding and complying with the General Order Waste Discharge Requirements for Existing Milk Cow Dairies (Central Valley Regional Water Quality Control Board Order R5-2007-0035). Effort has been made to ensure accuracy, but these summaries are not official regulatory guidance and are not legal advice. Producers are advised that these summaries are not intended to be a substitute for producers reading the complete order and consulting their own legal counsel to ensure compliance with the waste discharge requirements. Should any information here conflict with the General Order and/or official information provided by the Regional Board, Board-provided information takes precedence.*

Technical review provided by: Regional Water Quality Control Board 5 CAFO staff. Financial support was provided wholly or in part by grants received from the California Dairy Research Foundation, and from the SWRCB Grant number 05-095-550-0. The contents of this document do not necessarily reflect the views and policies of the US EPA, SWRCB, or RWQCB, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.