



Irrigation (Fresh) Water Sampling Protocol

Carol Frate and Marsha Campbell Mathews
UCCE Farm Advisors, Tulare and Stanislaus Counties

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)¹. The Monitoring and Reporting Program of the General Order requires analysis of various types of materials to define baseline conditions, develop and implement a Nutrient Management Plan, and describe potential pollutant load in illegal discharges. This Monitoring and Reporting Program was revised in February, 2011² and describes minimum **irrigation water sampling** requirements to obtain data for use in the site specific Nutrient Management Plan. Results must be submitted to the Central Valley Regional Water Quality Control Board as part of the appropriate annual reporting activities (due July 1 of the following calendar year).

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

1. Table 1 outlines the minimum constituents and frequency of sampling analysis requirements specified under the revised MRP. For agronomic purposes, additional analyses may be needed.
2. The Regional Board requires that the laboratory analyzing irrigation water be accredited through the State of California Department of Public Health, Environmental Laboratory Accreditation Program.
3. Contact your analytical laboratory to obtain labels, description of preferred sample containers, sample preservation methods, required record keeping, and chain of custody forms.

Table 1. Nutrient Monitoring – Irrigation Water (Fresh Water) Analyses

Each irrigation event for each land application area:

Record volume (gallons or acre-inches) and source (well or canal) of irrigation water applied and dates applied.

One irrigation event during each irrigation season during actual irrigation events:

For each irrigation water source (well and canal):

Electrical conductivity (EC), total dissolved solids, and total nitrogen. (In lieu of sampling the irrigation water, the Discharger may provide equivalent data from the local irrigation district.)

Data collected to satisfy the groundwater monitoring requirements (domestic and ag supply wells) will satisfy this requirement.

¹Central Valley Regional Water Quality Control Board. 2007. Order No. R5-2007-0035. Waste Discharge Requirements for General Order for Existing Milk Cow Dairies. May 3, 2007. Available at http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2007-0035.pdf.

² Central Valley Regional Water Quality Control Board. 2011. Revised Monitoring And Reporting Program Order No. R5-2007-0035. General Order For Existing Milk Cow Dairies Available at http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2007-0035_mrp_rev.pdf

Part II - Sampling Preparation & Location Determination

1. Refer to your sampling and analysis plan to determine sampling locations. Use the name for each well indicated on the facility map developed for the NMP. A sampling spigot (hose bib or faucet) installed in the side of the pipe makes sampling more convenient when frequent sampling is necessary.
2. Irrigation wells may be sampled at the location where water is discharged into a standpipe or from a valve in the discharge pipe. See the CDQAP WDR Reference Binder Document #5.1 - Sampling Supply Wells and Subsurface (Tile) Drainage Systems for detailed information on sampling wells. Canal or river water sources often have multiple potential sampling locations, including:
 - The point of discharge, if the line discharges into a standpipe or ditch;
 - Directly from the canal or river just prior to the intake valve (use caution collecting these samples);
 - At the irrigation valve (only during a fresh water-only irrigation).
3. Gather sampling equipment needed (e.g., disposable gloves, safety goggles if handling preservatives, sample bottles, preservative, ice and ice chest, labels, chain of custody form, notebook, etc.)

Part III – Sample Collection

1. Contact your analytical laboratory prior to sampling to identify the appropriate size container. Many laboratories provide labeled sample bottles. The laboratory should also provide information about requirements for sample preservation and alert you to the laboratory holding time as well as inappropriate times to deliver samples.
2. Label each sample bottle with the source identification (consistent with identification on NMP map), the sampler's initials, the date and time of sampling, or with the information requested by the laboratory.

If the sample bottle CONTAINS preservative:

3. Wear gloves and safety goggles. Additional personal protection equipment may be necessary for certain types of preservatives.
4. Use a clean sample collection bottle of similar size to the sample bottle with preservative. Rinse this sample collection bottle 3 times with the water you will be collecting. Collect the sample into this collection bottle. Remove the lid from the laboratory bottle with the preservative and place the lid in a zip-lock bag to keep it clean. Carefully pour the water from the collection bottle into the laboratory sample bottle with the preservative. **DO NOT** attempt to sample directly into a laboratory sample bottle that contains preservative and **DO NOT RINSE OUT PRESERVATIVE**. The clean, rinsed collection bottle may be reused as a sample bottle, if needed. Tightly cap the laboratory sample bottle (with preservative) and continue with step 7 below.

If the sample bottle DOES NOT CONTAIN preservative:

3. Remove the lid from the sample bottle and place the lid in a zip-lock bag to keep it clean.
4. Rinse the bottle 3 times with the water you will be collecting.
5. Collect sample directly into the bottle, leaving the proper head-space (open space at the top) as required by the laboratory.
6. Tightly cap the bottle.
7. Immediately put the bottle into an ice-cooled chest. **DO NOT FREEZE THE SAMPLE.**

8. For dairies that will do their own field electrical conductivity (EC) readings:
 - a. Calibrate probe prior to use.
 - b. Analyze EC on each sample & record results.
9. Complete the chain of custody form (provided by the laboratory) for all of the samples.
10. Deliver all samples to the laboratory within the specified holding time (consult with the laboratory).
11. Keep copies of all chain of custody forms and records on sample identification and collection at the facility.

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.