



Sampling Supply Wells and Subsurface (Tile) Drainage Systems

Compiled by Thomas Harter and Deanne Meyer, August 2007

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 **groundwater 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).

Identification of wells and tile drainage systems

All supply wells (domestic and agricultural) and tile drains associated with the production area and land application areas must be sampled once per year. Wells and tile drain outlets were identified during the mapping process associated with development of the Waste Management Plan. The unique identification (name/number/location) for each well and tile drainage sampling location should be used consistently when samples are collected to make laboratory results easier to use.

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

1. Table 1 outlines the minimum constituents and frequency of sampling and analysis requirements specified under the revised MRP.
2. Select a laboratory that is certified by the California Department of Health Services which can analyze your samples in accordance with the Title 40 Code of Federal Regulations Part 136 (*Guidelines Establishing Test Procedures for the Analysis of Pollutants*) or other test methods for which you have approval by the Executive Officer.
3. Contact your analytical laboratory to obtain sample bottles, labels and appropriate instructions for sample collection, preservation, holding times, required record keeping, and chain of custody forms. Ask lab personnel to identify appropriate sample drop off times for the type of samples and analyses needed.

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.

²Central 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

Table 1. Groundwater monitoring of domestic and agricultural supply wells and tile drains.

<p><u>Supply Wells</u></p> <p><u>Annually</u> Field measurements of electrical conductivity and ammonium nitrogen (if ammonium nitrogen is present during field testing, then laboratory analysis for ammonium nitrogen is required).</p> <p>Laboratory analyses of nitrate-nitrogen.</p> <p><u>Every five years</u> (may be distributed over a 5-year period by sampling 20% of the wells annually): Laboratory analyses for general minerals (calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, chloride, and total dissolved solids).</p> <p><u>Tile Drains</u></p> <p><u>Annually</u> Field measurements of electrical conductivity and ammonium nitrogen¹. Laboratory analyses of nitrate-nitrogen, total phosphorus, and total dissolved solids.</p>
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Part II - Sampling Preparation & Location Determination

1. Identify sampling locations and names from Waste Management Plan map (e.g., name or number of well or tile drain, sampler, date and time sampled, etc). Use the same name for the each well each time it is sampled.
2. Gather sampling equipment needed, e.g., disposable gloves, safety goggles (if handling sample bottles with preservatives), sample bottles, preservatives, ice and ice chest, labels for sample identification, chain of custody forms, notebook for record-keeping, etc.

For Domestic supply wells:

3. Collect water samples before the pressure tank if possible; otherwise collect samples from the tap nearest to the pressure tank. Purge the well for at least twice the volume if the sample cannot be taken prior to the pressure tank.
4. Allow water to run for 10 to 20 minutes prior to collecting the sample.

For Irrigation supply wells:

3. Identify a sampling location as close to the wellhead as practical. Installation of a sampling valve may be useful for future collection.
4. Allow water to run for at least 30 minutes or three well volumes prior to collecting the sample.

For Tile drains:

3. Collect tile drain sample at the discharge point into a canal or an irrigation drain.
4. The sample should represent the nature of the material being discharged.

Part III – Sample Collection

1. Label sample bottle with well or tile drain identification, sampler's name, and the date and time of sampling.
2. Put on sampling gloves and safety goggles (if handling sample containers with preservatives).
3. Remove lid from sample bottle. Be sure to keep the lid clean.
4. Rinse the sampling bottle 3 times with the water you will be collecting **UNLESS YOUR BOTTLE HAS A PRESERVATIVE IN IT. DO NOT RINSE OUT PRESERVATIVE.**
5. Collect sample into the bottle, leaving the proper head-space (open space at the top) as required by the laboratory.
6. Preserve sample as required by your laboratory (ice for electrical conductivity; typically with sulfuric acid to pH less than 2 for ammonium nitrogen and total phosphorus samples; nitric acid to pH less than 2 for minerals). The laboratory may provide sample bottles that include preservative.

Alternatively, the laboratory may require that samples be chilled immediately and transported to the laboratory within a few hours where laboratory personnel will preserve with acids.

7. Tightly cap the bottle.
8. Immediately put the bottle into an ice-cooled chest. **DO NOT FREEZE THE SAMPLES.**
9. Conduct field analysis of electrical conductivity (EC) on a separate sample & record results. If your analytical laboratory will perform EC analysis you will need to take an additional sample. One sample will be preserved on ice for EC and nitrate-nitrogen analysis. The other sample will be preserved with sulfuric acid for analysis of total phosphorus and nitric acid, and minerals.
10. Complete the chain of custody form.
11. Deliver sample(s) and chain of custody form(s) to laboratory before the required holding time has expired (typically 48 hours for nitrate-nitrogen and 28 days for total phosphorus).
12. Keep a copy of the chain of custody form and all records on sample collection & identification.

Recordkeeping requirement:

Well type and identification: _____
Well or subsurface (tile) drainage system location: _____
Date and time of sample collection: _____
Date sample submitted to laboratory: _____
Name of individual taking sample: _____
Well purge time: _____
Field measurement of electrical conductivity: _____
Location of sample port or tile drainage discharge point: _____
Preservative method used (ice cooling or other): _____
Laboratory analyses requested: _____

Additional information

Contact your analytical laboratory for additional information on sample collection, handling, preservation, and delivery. Contact the Central Valley Regional Water Quality Control Board for any other information requests:

http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/general_order_guidance/sampling_analysis/sampling_procedures_rev_30jan09.pdf.

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.