



Sampling Surface and Ground Water Sources

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In January, 2012, the North Coast Regional Water Quality Control Board adopted three General Orders for dairy facilities. Order No. R1-2012-0003 is a Conditional Waiver of Waste Discharge Requirements, Order No. R1-2012-0002 is a General Waste Discharge Requirement, and Order No. R1-2012-0001 is a General National Pollutant Discharge Elimination System (NPDES; No. CAG011001) Waste Discharge Requirements for concentrated animal feeding operations within the North Coast Region¹. All three General Orders require monitoring of surface and ground waters as part of their Monitoring and Reporting Programs. This document describes sampling protocols, sample analytes, and reporting requirements.

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

1. 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.
2. 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.
3. Refer to the tables at the end of this document to determine which analyses you will need to order from the laboratory in order to meet your General Order requirements.

Part II - Sampling Preparation & Location Determination

1. Determine how you will identify your samples (e.g., your sample identification should be consistent with well names or surface water sampling points identified on your facility site map).
2. Gather sampling equipment needed: 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, field test kits and useful record keeping templates.
3. Use caution when handling all bottles containing preservative.
4. Communicate with laboratory personnel to identify an appropriate time for them to receive samples with brief laboratory holding times and obtain any additional important information.

Surface water sampling

Operators are encouraged to join a watershed sampling group for surface water sampling and analyses. Collect samples in the rainy season, during or directly following each of three (3) major storm events² which are at least one (1) month apart. Collect samples only when conditions are safe to do so. Visual observations, such as

¹ Dairy Permits and associated information available at http://www.waterboards.ca.gov/northcoast/water_issues/programs/dairies/#permit accessed September 5, 2012.

² 1 inch of rain or more in 24 hours

changes in color or turbidity, must also be recorded at the time of surface water sampling and reported in the Annual Report.

If you are involved in a watershed group monitoring program you may or may not need to take your own samples. For those individuals responsible for sampling, **take grab samples of surface watercourses from the identified sampling points in the watershed.** If the sampling represents an individual dairy, sample waters that flow through the dairy property (owned or leased) including the production area, cropland, or pastures **where watercourses enter and leave the property.** If multiple watercourses flow through the property, the Discharger may request, in writing, reduced representative sample locations. If **surface waters flow adjacent** to, but not through, the property, and could be impacted by activities at the dairy, samples should be collected **upstream and downstream of the areas closest to the dairy property**, assuring legal access for sampling.

Information on surface water sampling is located on pages 3 and 4 of the Conditional Waiver Monitoring and Reporting Program. A Surface Water Sampling Record Keeping Template is available for use (North Coast Reference Binder Tab 6.3 available at <http://www.cdqa.org>).

Groundwater well sampling

Samples of representative wells shall be taken twice annually beginning in Fall, 2012. Collect final samples in Spring, 2014. Collect water samples before the pressure tank or nearest the wellhead if possible. Installation of a sampling valve may be useful for future use.

Allow water to run for 10 to 20 minutes (three well volumes) prior to collecting the sample.

Part III – Sample Collection

1. Label sample bottle with sample identification (see Part II, #1), sampler's initials, 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. For surface water samples: rinse the sampling bottle 3 times with the water you will be collecting. (For **groundwater samples fill the bottle directly, without overtopping**, to avoid losing the preservative. **DO NOT RINSE OUT PRESERVATIVE.**)
5. Collect sample into the bottle leaving about ½ inch head-space (open space at the top) as required by the laboratory (check this when you request your bottles and forms).
6. Add preservative to the sample as required by your laboratory (typically with sulfuric acid to pH less than 2 for nitrate nitrogen and sodium thiosulfate for fecal coliforms). The laboratory may provide sample bottles that include preservative.
7. Tightly cap the bottle.
8. Immediately put the bottle into an ice-cooled chest. **DO NOT FREEZE THE SAMPLES.**
9. Conduct field analysis for appropriate analytes (surface water) and record results.
10. Complete a chain of custody form for samples delivered to the analytical laboratory.
11. Deliver samples for Fecal Coliform analysis to the laboratory well before the required holding time (6 hours).
12. Keep a copy of the chain of custody form and records on sample identification and collection with your recordkeeping system.

Recordkeeping requirement:

| | |
|---|--|
| Well type and identification | |
| Surface water sample location | |
| Date and time of sample collection | |
| Date sample submitted to laboratory | |
| Name of individual taking sample | |
| Well purge time | |
| Preservative method used (ice cooling or other) | |
| Laboratory analyses requested | |

**R1-2012-0002 General WDR and
R1-2012-0003 Conditional Waiver of WDR
Monitoring and Reporting Requirements**

Surface Water analyses:

Container should be glass or sterile plastic

| Parameter | Units | Sample Type | Analytical Test Method | Hold time* | Preservation |
|--------------------------------------|----------|-------------|------------------------------|----------------------|-----------------------|
| Temperature | °C | Grab | Meter | immediate | None |
| pH | pH units | Grab | Meter | 15 min | None |
| Electrical conductivity ^a | Mmhos | Grab | Meter | 28 days | Cool < 42° F |
| Total ammonia nitrogen | mg/L | Grab | Field test kit or 40 CFR 136 | Immediate or 28 days | None or sulfuric acid |

* Samples should be analyzed as soon as possible after collection. The hold times listed are the maximum times that samples may be held between collection and the start of analysis for the data to be considered valid.

^a Three measurements of electrical conductivity taken three minutes apart shall be recorded during each sampling event at each location.

Groundwater analyses:

Container-glass or sterilized plastic; plastic.

| Parameter | Units | Sample Type | Analytical Test Method | Hold time* | Preservation |
|-------------------------|------------|-------------|------------------------|------------|--------------------|
| Nitrate-Nitrogen | mg/L | Grab | 40 CFR 136 | 28 days | Sulfuric acid |
| Fecal Coliform bacteria | MPN/100 ml | Grab | 40 CFR 136 | 6 hours | Sodium thiosulfate |

* Samples should be analyzed as soon as possible after collection. The hold times listed are the maximum times that samples may be held between collection and the start of analysis for the data to be considered valid.

R1-2012-0001 NPDES Permit and WDR Monitoring and Reporting Requirements

Surface Water analyses:

Container-glass or sterilized plastic

| Parameter | Units | Sample Type | Analytical Test Method | Hold time* | Preservation |
|-----------------------------------|----------------|-------------|------------------------|------------|---------------|
| Total Suspended Solids | mg/L | Grab | 40 CFR 136 | 7 days | Cool < 42° F |
| Ammonia-Nitrogen | mg/L | Grab | 40 CFR 136 | 28 days | Sulfuric acid |
| Total Nitrogen | mg/L | Grab | 40 CFR 136 | 28 days | Sulfuric acid |
| Total Phosphorus | mg/L | Grab | 40 CFR 136 | 28 days | Sulfuric acid |
| Specific Conductance ^a | umhos | Grab | Meter | 28 days | Cool < 42° F |
| pH | standard units | Grab | Meter | 15 min | None |
| Temperature | °C | Grab | Meter | Immediate | None |

* Samples should be analyzed as soon as possible after collection. The hold times listed are the maximum times that samples may be held between collection and the start of analysis for the data to be considered valid.

^a Three measurements of electrical conductivity taken three minutes apart shall be recorded during each sampling event at each location.

Groundwater analyses:

Container-glass or sterilized plastic; plastic.

| Parameter | Units | Sample Type | Analytical Test Method | Hold time* | Preservation |
|------------------------|------------|-------------|------------------------|---------------------------|--------------------|
| Total Dissolved Solids | mg/L | Grab | 40 CFR 136 | 7 days | Cool < 42° F |
| Nitrate-Nitrogen | mg/L | Grab | 40 CFR 136 | 28 days | Sulfuric acid |
| Total Coliform | MPN/100 ml | Grab | 40 CFR 136 | 6 hours | Sodium thiosulfate |
| Depth to groundwater | Feet | Observation | Measurement | Taken at time of sampling | Not applicable |

* Samples should be analyzed as soon as possible after collection. The hold times listed are the maximum times that samples may be held between collection and the start of analysis for the data to be considered valid.

Note: Total dissolved solids, nitrate-nitrogen, and total coliform analyses shall be performed annually; depth to groundwater measurement shall be made semi-annually, once in April and again in October.

If the Nitrate Groundwater Pollution Hazard Index exceeds 20, then groundwater monitoring via dedicated monitoring wells may be required. Monitoring shall be conducted in accordance with the specifications below.

| Parameter | Units | Sample Type | Analytical Test Method |
|------------------------|------------|-------------|------------------------|
| Total Dissolved Solids | mg/L | Grab | 40 CFR 136 |
| Nitrate-Nitrogen | mg/L | Grab | 40 CFR 136 |
| Total Coliform | MPN/100 ml | Grab | 40 CFR 136 |
| Depth to groundwater | Feet | Observation | Measurement |

Additional information

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

http://www.waterboards.ca.gov/northcoast/water_issues/programs/dairies/#permit .

A list of ELAP laboratories is maintained at

<http://www.cdph.ca.gov/certlic/labs/Documents/ELAPLablist.xls> .

For more information on official methods review:

Federal Register. March 12, 2007. Environmental Protection Agency. 40 CFR Part 122, 136, et al. Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Analysis and Sampling Procedures; Final Rule. Vol. 72, No. 47: 11200-11249.

Information in this document was compiled by CDQAP to assist dairy producers in understanding and complying with the three North Coast Region General WDR or Waiver of WDR for dairies. 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 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 Orders and/or official information provided by the Regional Board, Board-provided information takes precedence. Format of this document is consistent with that of Sampling Supply Wells and Subsurface (Tile) Drainage Systems, Compiled by Thomas Harter and Deanne Meyer, August 2007 for dairies in the Central Valley.