



Monitoring Offsite Discharges of Storm or Tail Waters from the Production Area or Land Application Areas

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The objective of this document is to identify how to sample and report off-site discharges to surface water of storm water and tailwater from the production and land application areas associated with dairy operations.

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 (the Order)¹ that requires dairy operators to report process wastewater, storm water, and certain tailwater off-site discharges that end up in surface water. These discharges must now be monitored to document any potential pollutants leaving the control of the dairy operator. There are four categories of off-site discharges that must be monitored, three of which are covered in this publication:

- 1) storm water discharges to surface water from the production area;
- 2) storm water discharges to surface water from land application areas²;
- 3) tailwater discharges from land application areas to surface water where irrigation has occurred less than 60 days after application of manure and/or process wastewater.

Unauthorized discharges of manure or process wastewater from either the production or land application areas, is covered in a separate publication (WDR General Order Reference Binder document #8.2³). A discharge is defined as the release of waste to land, surface water, or groundwater. Monitoring requirements of the General Order require the owner/operator to complete the following in the event of a discharge:

- ✓ Document discharge information (WDR Reference Binder document 6.16 also available from:
http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/complying_with_general_order/dairy_forms/priority_reporting.pdf (accessed Oct, 2009))
- ✓ Sample discharge water(s) and potentially upstream and downstream waters

¹ 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 Sample locations must be chosen such that the samples are representative of the quality and quantity of storm water discharged.

³ WDR Reference Binder available at <http://www.cdqa.org/binder.asp>.

- ✓ Report discharge information within 24 hrs to Regional Board; submit written report within 2 weeks and lab results within 45 days
- ✓ Summarize information in next Annual Report under Storm Water Reporting section

When do I collect a sample during a discharge?

Collect samples as soon as conditions are safe enough to physically access the discharge location. Discharges may occur during storm or irrigation events when operators may be unable to collect samples because of dangerous weather or field conditions (local flooding, high winds, tornados, electrical storms, etc.). Documentation of the discharge (including notation regarding the reason no samples were taken) and reporting are still required even if it is unsafe to collect samples.

How frequently do I need to sample off-site discharges?

Each of the three categories of discharges has its own sampling frequency requirements:

- 1) Storm water discharges from the production area to surface water should be **sampled daily** during each discharge.
- 2) Storm water discharges from land application areas should be **sampled twice during the wet season** (between October 1st and May 31st). One-third of the land application areas should be monitored each year, effectively rotating among all areas over a three year period. The first annual samples should be taken during the first storm event of the season that produces significant storm water discharge, defined as continuous storm water runoff for a minimum of one hour, or intermittent storm water runoff for a minimum total of three hours in a 12 hour period. The second annual samples should be collected during the peak storm season (typically February). These samples shall be taken during a storm event that produces significant storm water discharge and that is preceded by at least three days of dry weather. Based on the previous year's data, the discharger may propose in the annual storm water report to reduce the constituents and/or sampling frequency of storm water discharges to surface water from any land application area.
- 3) Tailwater discharges should be sampled once during each discharge from each land application area where irrigation has occurred less than 60 days after application of manure and/or process wastewater.

Where do I collect my samples?

Samples should be collected at the point of the discharge. Sample locations should be selected so that samples represent the actual material discharged. Additionally, if manure or process wastewater is discharged directly into surface water (creek, stream, river) or into any conveyance discharging to surface water, samples must also be taken upstream and downstream from the discharge location. Take upstream samples far enough upstream so the discharge does not influence the results. Retrieve downstream samples just far enough downstream from the discharge so the material is blended with the receiving water but not influenced by dilution flows or other discharges.

Typically, a surface water sample will be collected from the bank of an irrigation ditch or canal, or from the side of some other man-made conveyance. If it is unsafe to sample the discharge (because of unstable banks, high winds, or other extreme conditions, for example), then the unsafe conditions should be documented and the discharge should not be sampled.

Which containers do I use for sample collection?

Clean sample bottles may be obtained from your analytical laboratory. Work with your analytical laboratory before the winter storm season to assemble a sampling kit containing the appropriate bottle sizes and preservatives needed for sampling. Table 1 lists typical sample bottle sizes and preservatives necessary to obtain sufficient material for the various analyses required by the Central Valley Regional Water Quality Control Board. Your analytical laboratory should be aware of the requirements in the General Order and assist you in meeting these requirements.

If the preservatives are placed in the bottles by the laboratory, the bottles must be handled carefully to avoid exposure of personnel to the preservative. If the laboratory provides the preservative in a

separate container, use caution when transporting and opening the container of preservative, as well as in dispensing it into the sample bottle. Emergency protective equipment (gloves, safety goggles, acid neutralizer, spray bottle containing water, etc.) should be readily available when handling containers of preservative. Do not overfill containers when preservatives are present.

Table 1. Sample container types, preservation requirements, analytes, and allowable holding times.			
Sample container size and type ⁽¹⁾	Preservative	Analytes	Maximum holding time
1 liter (ℓ) P, TP, G ⁽²⁾	Ice chest (≤6 C)	Turbidity	<48 hrs
250 ml to 1 ℓ P, FP, G	Ice chest (≤ 6 C)	Nitrate-N	48 hours
250 ml P, FP, G	H ₂ SO ₄ to ≤pH 2	Total phosphorus	28 days
100 ml sterile bottle P, G	Na ₂ S ₂ O ₃ ; ice chest (≤ 10 C)	Total and fecal coliform	<6 hrs
250 ml P, FP, G	None	On farm analyses of Electrical conductivity, temp (take immediately), pH (within 15 minutes), total ammonia-nitrogen, and unionized ammonia-nitrogen	Within 15 minutes
250 ml P, FP, G	Ice chest (≤6 C)	EC (may be done in laboratory)	28 days
250 ml P, FP, G	Ice chest (≤6C), H ₂ SO ₄ to ≤pH 2	Ammonia-nitrogen (may be done in laboratory)	28 days

⁽¹⁾Container type, preservation techniques and holding times are from Table II of Part 136 of Title 40 of the Code of Federal Regulations. Federal Register Vol 72. NO 47. March 12, 2007. Page 11236.
⁽²⁾Sample container types: P=polyethelene; FP = fluoropolymer; G= glass.

What do I use to collect my samples?

A sampling pole should be used to extend the reach in order to submerge a sample bottle into the liquid to be sampled. A wood pole may be adequate, but an extendable aluminum pole, such as is used for cleaning swimming pools, can allow a greater reach. Sample bottles should be securely attached to the pole to ensure the safety of the operator, retrieval of the sample, and avoid over topping.

What special training is needed for sample collectors?

Individuals conducting sampling need to understand the importance of ensuring that the sample location site is safe. Sampling off-site discharges may put someone in an area of high flowing or rapidly rising waters, high winds, or unstable footing. Samplers should work in pairs and attached to a life line, when necessary. Personal flotation devices should be available. Individuals conducting sampling should wear safety goggles and protective latex, rubber or nitrile gloves when collecting and preserving samples. There should always be a supply of fresh water available in case of emergency.

Individuals collecting samples must be trained and familiar with sample collection, preservation, storage techniques and requirements, and maximum holding times. Bottles should be filled to nearly full, capped tightly, placed upright in coolers, stored in a cold environment, and submitted to the laboratory within the required holding time.

The individuals collecting the samples also need to understand how to complete a chain of custody form. Your analytical laboratory will provide the form with sample bottles and instructions for collection and preservation of samples. Review the chain of custody form before a discharge occurs. Contact your laboratory if you have questions. Because discharge events don't always occur during business hours, take the time to resolve any problems before you need to sample.

How do I label samples?

All samples collected need proper identification with sufficient information to allow completion of a chain of custody form obtained from the analytical laboratory. The sample container label should include the following information: site location (as identified in the nutrient and waste management plans), sample number, sample location (farm), date and time of sampling, and initials of the individual who took the sample. Use permanent markers when writing on sample bottle labels. It is best to have the label affixed to the bottle and completely filled out prior to retrieving the sample, since labels do not stick well on wet or chilled bottles.

How do I complete the chain of custody form?

A chain of custody report is the detailed history of the collection and handling of the sample. It is important to provide a complete chain of custody form for each sample to insure integrity of sample collection and handling. This form provides required documentation for laboratory and regulatory staff and will be submitted with your Annual Report.

How long can samples be stored prior to delivery to the laboratory?

Samples should be delivered to the laboratory as soon as possible after collection. This provides the greatest flexibility for the laboratory to process the samples. Each off-site discharge analyte has a specified holding time defined in Title 40 Code of Federal Regulations Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants). The times listed are the maximum times that samples may be held before the start of analysis and still be considered valid (e.g., samples analyzed for fecal coliform may be held up to 6 hours prior to commencing analysis). If the discharge event occurs at a time when the specified delivery window cannot be met, document the circumstances in writing and include documentation in all reports to the Regional Water Quality Control Board. Expired samples should not be presented to the laboratory for analysis. It may be valuable to contact the laboratory while in route to assure that the samples may be analyzed upon arrival to the laboratory. Close communication with the laboratory staff is helpful.

What kind of laboratory do I need for the analyses?

Laboratories analyzing off-site discharge samples must be certified by the California Department of Health Services for methods E-107 (Microbiology of Wastewater) and E-108 (Inorganic Chemistry of Wastewater). A list of certified laboratories may be found at:

<http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx> .

What analysis do I need to request?

The laboratory analyses must be conducted 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 approved by the Executive Officer. Table 2 identifies the required analyses for each type of discharge.

What additional activities must be completed for the field analyses?

All field testing equipment must be maintained regularly and calibrated prior to running an analysis. Maintenance and calibration should be documented. Your analytical laboratory may be able to assist you in this process. Field test instruments for pH, and electrical conductivity may be used provided:

- a. The operator is trained in the proper use and maintenance of the instruments;
- b. The instruments are field calibrated prior to each monitoring event; and
- c. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency.

Table 2. Analytes for analysis in storm water and tail water discharges and surface water samples.				
Analyte	Material to be Sampled			
	Storm water from production area	Upstream and downstream of discharge ⁽¹⁾	Storm water from land application area ⁽²⁾	Tailwater discharge
Field analyses				
EC	✓	✓	✓	✓
Temperature	✓	✓	✓	✓
pH	✓	✓	✓	✓
Total ammonia-N	✓	✓	✓	✓
Unionized ammonia-N	✓	✓	✓	✓
Laboratory analyses				
EC ⁽³⁾	✓	✓	✓	✓
Total ammonia-N	✓	✓	✓	✓
Unionized ammonia N ⁽³⁾	✓	✓	✓	✓
Nitrate-N	✓	✓	✓	✓
Total phosphorus	✓	✓		✓
Phosphorus			✓	
Turbidity	✓	✓	✓	
Total coliform.	✓	✓	✓	✓
Fecal coliform.	✓	✓	✓	✓
⁽¹⁾ See text on page 2, section "How frequently do I need to sample offsite discharges? Part 2". ⁽²⁾ See text on page 2, section "How frequently do I need to sample offsite discharges? Part 3". ⁽³⁾ Analyses may be done in field or in laboratory as per: http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/general_order_guidance/sampling_analysis/sampling_and_analysis_21feb08.pdf				

What else do I need to do?

The General Order has specific recordkeeping and reporting requirements for discharge events. Tailwater discharges where manure has been applied in the last 60 days do not require additional notification and recordkeeping. The results of these laboratory analyses will be included in the Annual Report.

The Central Valley Regional Board has prepared a template for reporting of significant storm events (WDR Reference Binder document #6.16). This document is also available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/complying_with_general_order/dairy_forms/priority_reporting.pdf (accessed Oct., 2009).

Producers are obligated to notify the following agencies, by telephone, **within 24** hours of the discharge from a significant event. The following information should be included in a message: time, date, location, nature of the discharge, name and contact information of the reporting party. Voice messaging systems should be available for each of these agencies.

- Central Valley Regional Water Quality Control Board Contact information
 - o Rancho Cordova: (916) 464-3291
 - o Fresno: (559) 445-5116
 - o Redding: (530) 224-4845
- Local environmental health department

California Office of Emergency Services (OES)

OES Inland Region North	OES Inland Region Headquarters	OES Inland Region South
1740 Walnut Street Red Bluff, CA 96080 (530) 529-0409 Fax: (530) 529-5079	3650 Schriever Avenue Mather, CA 95687 (916) 845-8470 Fax: (916) 845-8474	2550 Mariposa Mall, Rm 181 Fresno, CA 93721 (209) 445-5672 Fax: (209) 445-5987

- Complete and submit a written report of significant events **within 2 weeks** of the discharge to the appropriate Central Valley Regional Water Quality Control Board office (see Table 3).
- Submit laboratory results from discharge samples, and any upstream and downstream surface water samples taken, to the Central Valley Regional Water Quality Control Board **within 45 days** of the discharge.
- Complete and submit a summary of storm water discharges in the Storm Water Reporting section of next year's Annual Report.

Table 3. Central Valley Regional Water Quality Control Board office to submit documents to based on geographic location.

	Redding	Sacramento	Fresno
If your facility is in:	Butte, Lassen, Modoc, Plumas, Tehama, and Shasta Counties	Glenn, Yuba, Yolo, Sacramento, San Joaquin, Stanislaus, and Merced Counties	Fresno, Kern, Kings, Madera, Mariposa, and Tulare Counties
Send the Report to:	Agricultural Unit Regional Water Board 415 Knollcrest Drive, Ste 100 Redding, CA 96002 (530) 224-4845	CAFO unit Regional Water Board 11020 Sun Center Drive #200 Rancho Cordova, CA 95670 (916) 464-3291	Agricultural Unit Regional Water Board 1685 E Street Fresno, CA 93706 (559) 445-5116

Summary

Discharges of storm water or tailwater from the production or land application area must be sampled and reported. Discharge of storm water to surface water from the production area is not authorized under the General Order. This may occur from poorly maintained berms, use of illegal pipes to transfer manure off-site, poorly operating tailwater return systems, etc. The General Order has specific recordkeeping, sampling and reporting requirements for these discharges.

Information in this document was compiled by UCCE and 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 reviews provided by: Regional Water Quality Control Board 5 Confined Animal Facility Staff. Editor: Denise Mullinax, Assistant Manager California Dairy Quality Assurance Program.

Financial support was provided in part by a grant from the California Dairy Research Foundation.

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