
NORTHWEST SUSTAINABLE DAIRIES

**ENVIRONMENTAL
STEWARDSHIP**



INTRODUCTION

The states of Oregon and Washington have responded to concerns about agriculture's impact on the environment, particularly with maintaining good water quality. Dairy farm families, their employees, and their animals all rely on the same natural resources as their neighbors, so protecting water quality is an important issue. Northwest dairy farmers have proactively worked with state agencies to develop a regulatory climate aimed to reduce the potential for contamination of ground and surface waters.

Maintaining appropriate facilities and proper management is imperative for protecting waters of the state. *Manure management facilities*, responsible *manure handling* practices and *record keeping and documentation* are all key factors for making sure water quality is protected. If at any time a dairy farmer is unable to meet water quality expectations, enforcement action can be taken.

Effective and progressive management to protect the environment remain an ongoing focus. This document details the commitment to environmental stewardship on Northwest dairy farms.

Further information about water quality protection practices and requirements of dairy farmers can be found at the Oregon Department of Agriculture Confined Animal Feeding Operation Program website (oregon.gov/ODA/NRD/cafo_front.shtml) or the Washington State Department of Agriculture Livestock Nutrient Management Program website (agr.wa.gov/FoodAnimal/Livestock-Nutrient/Livestocknutrient.htm).



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MANURE MANAGEMENT FACILITIES

Guiding Principle: Facilities should be designed and managed to effectively collect, store, and manage manure and process waste water generated by the dairy farming activities as a means to protect water quality.

A. ANIMAL HOUSING/BARNS

Expectation: Buildings used to house dairy cattle must be constructed and managed in a manner that will contain manure within the housing facility. Buildings also must function to keep rain and clean stormwater from mixing with manure.

Background: Dairy animals are commonly housed in barns, especially during wet weather. Manure generated in the housing facility must not discharge from the barn, so it is important that barns be constructed and managed to prevent discharges. Barn openings and gutters should be managed to exclude stormwater, helping minimize the total volume of waste to be handled. To promote animal health and well-being, manure is frequently removed from the barn. Manure is then transferred to a facility designed to store manure until it can be used as a nutrient source and applied to fields or exported off-site.

Investing in facilities specifically designed to collect and store manure and process waste water is important for protecting water quality.

Proper management of animal housing and manure storage facilities protects water quality and promotes animal health and well-being.

*Note: See **MANURE HANDLING** for more information about manure application and see **RECORD KEEPING AND DOCUMENTATION** for more information about exporting manure.*

Verification: Visual inspection of animal housing/barns.

B. MILKING PARLOR AND MILK HOUSE

Expectation: Waste water generated from milking parlor, milk house, and other dairy activities must be handled as a potential pollutant.



Background: After each milking, the milking parlor and milking equipment are cleaned. A significant volume of water is also used to clean out milk storage tanks after milk is hauled off of the farm. Since wash water often comes in contact with manure, it is treated like manure. Wash water generated from the milking operation should be directly transported to and stored in the manure storage facility. Water running off from feed storage areas also should be transported to and stored in the manure storage facility.

Verification: Visual inspection of milking parlor and milk house (drains, grates, pipes, etc.). Visual inspection of wash water entry point into manure storage facility.

C. MANURE STORAGE

Expectation: All manure and waste water must be stored in structures/facilities designed for this purpose.

Background: Facilities used to store manure and other dairy waste water must be appropriately designed. Manure storage facilities allow dairy farmers to collect and store manure until it is appropriate for the manure to be applied to crop ground and/or exported off the farm. Manure can usually be stored for several months, so it is critical for storage facilities to be properly designed and sized to protect water quality.

Verification: Visual inspection of manure collection and storage facilities. Review of construction/engineering plans for manure storage facilities. Review of current operational size.

D. OPERATION AND MAINTENANCE

Expectation: Waste handling equipment and storage facilities that collect, store, treat, or apply manure must be operated and maintained according to design.

Background: Waste handling equipment and storage facilities are generally designed for a specific purpose. To maintain the functionality of the equipment and facilities, they must be operated and maintained according to design. Failure to do so can affect integrity and functionality. Operation and maintenance procedures should be routinely reviewed with all employees involved with these operations.

Verification: Visual inspection of animal housing/barns, manure storage facilities, and waste handling equipment.



MANURE HANDLING

Guiding Principle: Application of manure to fields should be performed in a manner that is conducive to crop production and provides water quality protection.

A. MANURE APPLICATION

Expectation: Application of manure must be done in accordance with the approved Nutrient Management Plan. Consideration should be given to the rate (amount), timing, and placement of each manure application, as well as the nutrient content of the manure and projected crop utilization.

*Note: See **RECORD KEEPING AND DOCUMENTATION** for more information about Nutrient Management Plans.*

Background: Manure is a natural, organic fertilizer that provides nutrients and organic matter for soil health and crop productivity. Using manure as a fertilizer source reduces or eliminates the need for commercial fertilizer.

Manure generated by dairy cattle can be recycled and used as a fertilizer for crops. Proper manure application rates, along with appropriate timing and placement, must be practiced by the Northwest dairy farmers to ensure water quality protection.

I. APPLICATION RATE (AMOUNT)

Expectation: Manure application must be made at agronomic rates.

Background: The application rate of manure should match crop needs. Excess nutrients from over-application of manure can result in an accumulation of nutrients in the soil profile (such as nitrogen, phosphorus, and salts), leaching of nutrients to groundwater (such as nitrate), or runoff to surface waters. Because manure contains bacteria, over-application can also result in bacteria reaching and contaminating surface waters. Manure application rates should be adjusted based on factors such as crop type and stage, soil type, and timing.

Note: Assistance in determining appropriate application rates can be found in "Manure Application Rates for Forage Production" by T. Downing, D. Sullivan, J. Hart and M. Gamroth (2007).



Verification: Visual inspection of manure application area. Review manure application and crop yield records. Review documentation for calibrating manure application equipment. Review the most current soil tests and any available manure tests. Review Nutrient Management Plan and compare to visual inspection and records.

II. TIMING

Expectation: Manure must be applied during appropriate weather and crop conditions. Manure must not be applied to saturated soils or to an extent that large surface pooling occurs during application. Manure must be applied so runoff does not occur after application.

Background: When manure is applied to fields, the soil should be dry enough to retain and hold the manure within the soil profile. This allows crop roots to utilize the nutrients in manure for growth and avoids surface runoff.

Verification: Visual inspection of manure application area. Review manure application records and any available crop records. Review Nutrient Management Plan and compare to visual inspection and records.

III. EQUIPMENT

Expectation: Manure application equipment must be calibrated. During manure application, equipment should be monitored to assure the proper amount is delivered to the desired target field.

Background: Applying manure with calibrated equipment helps a dairy farmer deliver the appropriate amount of nutrients to the field during manure application.

Verification: Talk to owner or employee responsible for calibrating equipment. Review documentation for calibration of equipment. Review Nutrient Management Plan and compare to documentation.

B. BUFFERS (SETBACKS)

Expectation: Manure must not enter surface or ground water. In addition to appropriate application rates and timing, buffers must be used to reduce the risk of manure entering surface or ground water.



Background: When fields are in close proximity to surface water, additional measures must be implemented to provide protection of the adjacent water body. Buffers, also known as setbacks, are areas adjacent to water bodies where manure is not applied and are used as a tool for protecting water quality. Buffers serve as a filter in the event that surface runoff starts to occur. Buffers capture the runoff and prevent it from reaching surface water. Incline of the field, amount and type of vegetation in the buffer area, and the amount and type of manure applied are a few of the various factors that should be accounted for when determining the width of a buffer. The appropriate size of a buffer may vary by the time of year, with greater distances required for wet season applications.

Verification: Visual inspection of manure application and buffer areas. Review manure application records. Review Nutrient Management Plan and compare to visual inspection and records.



RECORD KEEPING AND DOCUMENTATION

Guiding Principle: All dairy farms must document manure management practices to manage nutrients appropriately.

A. NUTRIENT MANAGEMENT PLANS

I. REQUIREMENT

Expectation: All Northwest dairy farmers must have a written Nutrient Management Plan (NMP) that reflects current on-farm practices.

Background: Record keeping provides a “check and balance” for on-farm manure management activities.

The NMP is a technical document detailing manure management activities on the farm and serves three primary purposes:

- To prevent discharge of contaminated waste water to streams, ditches, or other surface waters.
- To prevent migration of contaminants to ground water.
- To supply crop nutrient needs.

Requirements for the NMP are determined by designated state institutions. A NMP contains a summary of the operation (herd size, acres of land, description of manure storage facilities, etc.), a nutrient application schedule and balance sheet, soil analysis, and other important information to protect water quality. Intentions should be to develop NMP’s that work to protect water quality as well as fit into practical management on a dairy farm.

Verification: Review NMP, comparing to requirements defined by the state, and check for consistency between current practices and plan elements.

Note: The Washington State Department of Agriculture requirements can be found online at: agr.wa.gov/FoodAnimal/Livestock-Nutrient/NutrientMgmtPlans.htm. The Oregon Department of Agriculture requirements can be found online at: oregon.gov/ODA/NRD/docs/pdf/awmp_minreq.pdf.

Documenting manure management is an important practice on dairy farms for water quality protection, as well as for crop production.

Records must be completed to assess on-farm practices and maintain a history of manure management activities.



II. REVIEW

Expectation: Once developed, the NMP must be submitted for review.

Background: Once the NMP has been developed, this document must be submitted for review by the State Department of Agriculture (in Oregon) or the local conservation district (in Washington). The document is reviewed for accuracy as well as feasibility.

The NMP must meet the state's criteria. If the NMP is not approved, then it is the Northwest dairy farmer's responsibility to make corrections and on-farm adjustments until the reviewing body is satisfied. Only when they are satisfied can the NMP be approved. Operating without an approved NMP can result in enforcement against the Northwest dairy farmer.

Verification: Review documentation to determine approval status of the NMP.

III. ON-FARM IMPLEMENTATION

Expectation: After the NMP has been approved, practices must be implemented on the farm as described in the plan.

Background: Once the NMP has been approved, Northwest dairy farmers need to implement the NMP. Inspections are performed by the State Departments of Agriculture in both states, at least every year or two, to determine if the dairy facilities and management activities performed are in compliance with their NMP and state regulations. Non-compliance can result in enforcement action against the dairy farmer. Plans should be updated, when necessary, to reflect changes in management, treatment, or structures on the farm.

Verification: Review NMP and compare to current farming practices.

B. RECORDS FOR MANURE APPLICATION

Expectation: All manure applications must be documented.

Background: Documentation of manure applications should be used to assist the dairy farmer with decisions for future manure applications (such as rate of application, location of application, etc.) and cropping decisions. Documentation helps maximize efficient use of the nutrients in manure for crop productivity and minimize the need for commercial fertilizers.



Guideline: Required documentation for manure application includes:

- *Location of application*
- *Amount of nitrogen and phosphorus applied*
- *Date of application*

Verification: Review manure application records and any available crop records.

C. RECORDS FOR MANURE EXPORTATION

Expectation: All manure exported off of the dairy farm must be documented.

Background: Just as dairy operations must keep track of the manure being applied to crops, it is also the Northwest dairy farmer's responsibility to track the amount of manure exported off the farm. Since manure is a fertilizer, it may be used for its nutrient content by individuals other than dairy farmers (i.e. crop farmers, composters, gardeners). The recipient of exported manure is responsible for proper manure management practices.

Verification: Review manure export records.

D. SOIL SAMPLING

Expectation: Soil samples must be collected and analyzed from all fields where manure has been applied.

Background: Soil testing is a scientifically accepted practice to measure the levels of nutrients in the soil. Soil testing helps monitor the changing nutrient content of soils and the information is used by farmers to make decisions about future manure applications and crop planting.

Guideline: Information for collecting soil samples can be found in the Nutrient Management Plan. There are also two extension publications with specific details on soil sampling in the Northwest: "Monitoring Soil Nutrients Using a Management Unit Approach" is available online at: extension.oregonstate.edu/catalog/pdf/pnw/pnw570-e.pdf. "Post-harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades" is available online at: extension.oregonstate.edu/catalog/pdf/pnw/pnw570-e.pdf.

Verification: Review current soil analysis and sampling frequency.



E. ANIMAL NUMBERS

Expectation: The number of animals on a dairy should be equal to or less than to the number used to write the NMP.

Background: Using the approved NMP, the maximum number of animals allowed on each farm is compared to the number on site. This practice is implemented to ensure farmers can effectively balance the amount of nutrients generated by their dairy animals, while protecting water quality.

Verification: Visual inspection of animals and comparison to allowed number of animals in NMP.



REFERENCES

Downing, T., D. Sullivan, J. Hart, and M. Gamroth. Revised 2007. Manure application rates for forage production. EM 8585-E. Oregon State University Extension Service. Online. Available: extension.oregonstate.edu/catalog/pdf/em/em8585-e.pdf.

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Washington State Department of Agriculture Livestock Nutrient Management Program website: agr.wa.gov/FoodAnimal/Livestock-Nutrient/Livestocknutrient.htm.

For more information, please contact Northwest Sustainable Dairies (www.northwestsustainabledairies.org).

