

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

Order No. R5-2007-0035

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
EXISTING MILK COW DAIRIES**

The California Regional Water Quality Control Board, Central Valley Region (hereafter, Central Valley Water Board), finds that:

SCOPE OF COVERAGE OF THIS ORDER

1. This Order serves as general waste discharge requirements for discharges of waste from existing milk cow dairies (defined in Finding 7) of all sizes.
2. This Order applies to owners and operators of existing milk cow dairies (hereinafter Dischargers) that: (1) submitted a complete Report of Waste Discharge in response to the Central Valley Water Board's 8 August 2005 request for such a report (2005 Report of Waste Discharge Request Letter) and (2) have not been expanded since October 17, 2005. Following formal written notification by the Central Valley Water Board, these Dischargers are required to comply with the terms and conditions of this Order. Dischargers that do not qualify for coverage under this Order will be covered under separate general or individual waste discharge requirements or a waiver of waste discharge requirements.

REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

3. The Central Valley Water Board authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater and the prevention of nuisances, is found in the Porter-Cologne Water Quality Control Act (California Water Code Division 7).
4. California Water Code Section 13260 requires any person discharging waste, or proposing to discharge waste, within the Central Valley Region, that could affect the quality of the waters of the state (which includes both surface waters and groundwaters) to file a report of waste discharge with the Central Valley Water Board.
5. The Central Valley Water Board is required to prescribe waste discharge requirements for proposed, existing, or material changes in discharges of waste and must implement the relevant water quality control plans. The Central Valley Water Board may prescribe general waste discharge requirements as to a category of discharges if all the following criteria apply to the discharges in that category:

- a. The discharges are produced by the same or similar operations.
 - b. The discharges involve the same or similar types of waste.
 - c. The discharges require the same or similar treatment standards.
 - d. The discharges are more appropriately regulated under general requirements than individual requirements.
6. In regulating discharges of waste, the Central Valley Water Board implements State laws and regulations. California regulations governing discharges from confined animal facilities are contained in Title 27 of the California Code of Regulations (CCR), Division 2, Subdivision 1, Chapter 7, Subchapter 2, Article 1 (Title 27).
 7. For the purposes of this Order, "existing milk cow dairies" means all dairies that were operating as of 17 October 2005, filed a complete Report of Waste Discharge in response to the 2005 Report of Waste Discharge Request Letter, and have not expanded ("expansion" is defined in Attachment E) since October 17, 2005.
 8. Existing dairy operations include herd sizes that may vary in order to ensure a constant milk production volume. Doing so requires a dairy operator to manage the herd, continually producing calves, raising support stock to replace cows that die or fail to produce, and selling some of the mature cows and support stock.
 9. Professionals at the University of California Davis estimate the normal variation in California dairy herd sizes ranges from about 10 to 15 percent.
 10. For the purposes of this Order, existing herd size is defined as the maximum number of mature dairy cows reported in the Report of Waste Discharge filed in response to the 2005 Report of Waste Discharge Request Letter, plus or minus 15 percent of that reported number to account for the normal variation in herd sizes.
 11. For the purposes of this Order, an increase in the number of mature dairy cows of more than 15 percent beyond the maximum number reported in the Report of Waste Discharge filed in response to the 2005 Report of Waste Discharge Request Letter is considered an expansion.
 12. There are approximately 1,600 milk cow dairies within the Central Valley Region (Region) that will be required to operate under the requirements of this Order. Each facility represents a significant source of waste discharge with a potential to affect the quality of the waters of the State.

13. For the purposes of this Order, “waste” includes, but is not limited to, manure, leachate, process wastewater and any water, precipitation or rainfall runoff that contacts raw materials, products, or byproducts such as manure, compost piles, feed, silage, milk, or bedding.
14. This Order implements the requirements of State Water Resources Control Board Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*) (Resolution 68-16), Title 27 CCR for confined animal facilities, the Central Valley Water Board’s Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.) and the Water Quality Control Plan for the Tulare Lake Basin (2nd Ed.) (Basin Plans) and other applicable plans and policies of the State Water Resources Control Board (State Water Board) and the Central Valley Water Board described in the Information Sheet, which is attached to and made part of this Order.
15. This Order does not authorize any further degradation to groundwater and prohibits discharges from production areas to surface waters. This Order also contains many restrictions, including the requirement to comply with a Nutrient Management Plan, for the application of waste to land application areas. However, it is possible that some minor degradation to surface waters from the application of waste to land application areas could occur despite compliance with this Order. That degradation would be limited because any such discharge may not cause or contribute to the exceedance of any water quality objective in the surface water. Such possible minor degradation is consistent with the maximum benefit to the people of the state. This Order would impose significantly more stringent requirements on these existing facilities than has been imposed in the past and as a result, water quality will be improved. While this Order will impose stringent new requirements, it will still accommodate important economic activities in mostly rural areas of the Central Valley Region, which is considered to be a benefit to the people of the State. Given that these are existing facilities, this Order would reduce the impacts that may have occurred under previous regulation of these facilities.

This Order will result in implementation of best practicable treatment or control as set forth in the Information Sheet.

This Order will assure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of the State will be maintained. For example, the proposed order prohibits discharges to surface water from the production area and prohibits discharges from land application areas unless, among other requirements, the dairy prepares and implements a Nutrient Management Plan. Any authorized discharge from the land application area must not cause or contribute to an exceedance of any applicable water quality objective or federal water quality criteria. The proposed order prohibits any further degradation of groundwater. The Order addresses impacts from future discharges

of waste, but does not address the cleanup of existing degraded surface and groundwater from past dairy operations. Any required cleanup would be handled under separate authority under the Water Code.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

16. The Central Valley Water Board is the lead agency for purposes of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) with respect to adoption of this Order.
17. In accordance with CEQA, the Central Valley Water Board adopted a Negative Declaration in 1982 with the adoption of Central Valley Water Board Resolution 82-036 (Waiving Waste Discharge Requirements for Specific Types of Discharge), which waived waste discharge requirements for confined animal facilities where the Discharger complies with Central Valley Water Board guidelines. That waiver program expired on 1 January 2003.
18. Food and Agricultural Code Section 33487 provides a statutory exemption from CEQA for dairy farms under the following circumstances: (1) when the dairy will be constructed and operated in accordance with the minimum standards in Chapter 5 of the Food and Agricultural Code; (2) where the applicable local agencies have completed all necessary reviews and approvals including that required by CEQA; and (3) where a permit for construction was issued by a local agency on or after the effective date of Food and Agricultural Code Section 33487 and construction has begun.
19. The benchmark for evaluating whether this Order will have impacts on the environment is the "environmental baseline." The environmental baseline normally consists of "a description of the physical environmental conditions in the vicinity of the project at the time...environmental analysis is commenced." (Title 14, California Code of Regulations, Section 15125(a).) The receipt of a permit application is one event that can be used to mark the beginning of the environmental review process and therefore an appropriate date for the environmental baseline. (*Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1278.) The applications for coverage under these General WDRs were solicited by Regional Board staff on August 8, 2005. The applications themselves (Reports of Waste Discharge) were due on October 17, 2005. The information contained in the applications, particularly herd size, presented staff with a description of the dairies, as they existed on the same date. The environmental baseline for the General WDRs, therefore, consists of the milk cow dairies (defined by their size and scope of herd, facilities, and operation) as they and their surrounding physical environment existed on October 17, 2005. Dairy herd size fluctuation is accounted for in that the environmental baseline incorporates the normal 15 percent variation in the number of mature dairy cows contained in a given herd.

20. CEQA provides several categorical exemptions from CEQA that apply to this Order including:
 - a. CEQA Guidelines Exemption 1 for Existing Facilities (Title 14 CCR Section 15301) that applies to “...*the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency’s determination...*”
 - b. CEQA Guidelines Exemption 2 for Replacement of Existing Structures (Title 14 CCR Section 15302) that applies to “...*replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced...*”
 - c. CEQA Guidelines Exemption 4 for Minor Alterations (Title 14 CCR Section 15304) that applies to “*minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes...*”
21. The adoption of this Order is categorically exempt from CEQA because:
 - a. Consistent with the “existing facility” exemption in Title 14 CCR Section 15301, eligibility under this Order is limited to milk cow dairies that were existing facilities as of 17 October 2005. This Order does not authorize expansion of use beyond that existing as of 17 October 2005. Restoration of, or improvements to dairy waste management systems to ensure proper function in compliance with this Order will involve minor alterations of existing private facilities.
 - b. Consistent with the categorical exemption in Title 14 CCR Section 15302, this Order will require covered dairies to replace or reconstruct waste management systems to ensure proper function in compliance with this Order.
 - c. Consistent with the categorical exemption in Title 14 CCR Section 15304, this Order will require covered dairies to make improvements to their waste management systems that will result in minor alterations to land, water, and/or vegetation.
22. This Order imposes significant new and more stringent requirements compared to previous waste discharge requirements or waivers of waste discharge requirements that have applied in the past to these existing facilities. This Order requires compliance with State Water Resources Control Board Resolution 68-16,

Title 27 CCR for confined animal facilities, and the Basin Plans. As a result, existing milk cow dairies will reduce their impacts to surface water and groundwater upon compliance with this Order. This Order does not authorize expansions of facilities. Such facilities must demonstrate compliance with CEQA and obtain separate waste discharge requirements. This Order prohibits:

- a. Discharges of waste and/or storm water to surface waters from the production area;
- b. Discharges of waste to surface waters which causes or contributes to an exceedance of any applicable water quality objective in the Basin Plans or water quality criteria set forth in the California Toxics Rule or the National Toxics Rule;
- c. The collection, treatment, storage, discharge or disposal of wastes at an existing milk cow dairy that results in (1) discharge of waste constituents in a manner which could cause degradation of surface water or groundwater except as allowed by this Order, (2) contamination or pollution of surface water or groundwater, or (3) a condition of nuisance (as defined by the California Water Code Section 13050);
- d. Discharges of wastewater to surface waters during or following wastewater application to cropland; and
- e. Discharges of storm water to surface water from the land application area where manure or process wastewater has been applied unless the land application area has been managed consistent with a certified Nutrient Management Plan (see Attachment C, which is attached to and made part of this Order).

This Order requires that discharges of waste from existing milk cow dairies shall not cause groundwater to be further degraded¹, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. This Order also requires monitoring of surface water and groundwater to demonstrate reduced impacts to surface water and groundwater upon compliance with this Order.

DAIRY IMPACTS ON WATER QUALITY

23. Groundwater monitoring shows that many dairies in the Region have impacted groundwater quality. A study of five dairies in a high-risk groundwater area in the Region found that groundwater beneath dairies that were thought to have good

¹ Further degradation will only be allowed under individual waste discharge requirements following an analysis as required by State Water Board Resources Control Board Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*).

waste management and land application practices had elevated levels of salts and nitrates beneath the production and land application areas. The Central Valley Water Board requested monitoring at 80 dairies with poor waste management practices in the Tulare Lake Basin. This monitoring has also shown groundwater pollution under many of the dairies, including where groundwater is as deep as 120 feet and in areas underlain by fine-grained sediments.

24. No set of waste management practices has been demonstrated to be protective of groundwater quality in all circumstances. Since groundwater monitoring is the most direct way to determine if management practices at a dairy are protective of groundwater, Monitoring and Reporting Program No. R5-2007-0035, which is attached to and made part of this Order, requires groundwater monitoring to determine if a dairy is in compliance with the groundwater limitations of this Order, unless the Executive Officer determines that an alternative method of environmental monitoring is appropriate and issues an individual monitoring and reporting program to the individual dairy pursuant to Water Code Section 13267.
25. The Central Valley Water Board has documented many discharges of waste from existing milk cow dairies to surface water and has taken appropriate enforcement actions in such cases. This Order prohibits discharges of: waste and/or storm water to surface water from the production area; wastewater to surface waters from cropland; and storm water to surface water from a land application area where manure or process wastewater has been applied unless the land application area has been managed consistent with a certified Nutrient Management Plan. When such discharges do occur, this Order requires the Discharger to monitor these discharges.
26. The milk cow dairies at which this Order is directed were in existence prior to October 2005 and many were constructed several decades ago. The waste management systems at these existing dairies are commonly not capable of preventing adverse impacts on waters of the state either because of their outdated design or need for maintenance or both. Historic operation of these dairies has presumptively resulted in an adverse effect on the quality of waters of the state. Groundwater data are needed to determine the existence and magnitude of these impacts. If data document impacts, continued operation of dairies without waste management improvements will perpetuate the ongoing adverse water quality effects caused by the generation and disposal of dairy waste.
27. As stated in Finding 22 above, this Order imposes new and more stringent requirements than these existing facilities have had applied to them in the past. Many Dischargers will need to make significant improvements in their facilities to meet these requirements. Improvements needed may include recycling flush water, grading, establishing setbacks, installing flow meters, exporting manure, leasing or purchasing land, etc. The Discharger may be able to make some of these improvements relatively quickly while some improvements may require more

time to implement. It is reasonable to allow Dischargers time to phase in elements of the required Waste Management Plan and Nutrient Management Plan in order to adequately design and construct major infrastructure changes needed to comply with all the requirements of this Order. This Order requires Dischargers to make any necessary interim facility modifications first in order to prevent discharges to surface water, improve storage capacity, and improve the facility's nitrogen balance before completing any necessary infrastructure changes.

STATE WATER RESOURCES CONTROL BOARD RESOLUTION 68-16

28. State Water Resources Control Board Resolution 68-16 requires that a Regional Water Quality Control Board maintain the high quality of waters of the state unless the Board determines that some degradation is consistent with the maximum benefit to the people of the state. The Board must assure that any activity which discharges a waste to existing high quality waters must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that pollution, i.e., exceedance of water quality objectives, or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained. This Order does not authorize degradation of waters of the State. It requires actions to be taken to assure that degradation does not occur, that water quality objectives are not exceeded, and that nuisance does not occur.
29. All dairies must be in compliance with Title 27. As explained in the Information Sheet, the Title 27 design standards for ponds have been determined to not be protective of groundwater quality and there are technologies available which can provide more groundwater protection. Because Section 13360 of the California Water Code requires that waste discharge requirements not specify the design, location, type of construction, or particular manner in which compliance may be had with the requirements, this Order cannot specify any particular pond design. This Order does however establish requirements for ponds that are more stringent than Title 27 in order to provide groundwater protection by including a performance standard and allowing a very conservative pond design without a demonstration of the pond's performance or an alternative design with a performance demonstration.
30. Consistent with State Water Resources Control Board Resolution 68-16, this Order requires use of best practicable treatment or control, specifically that new ponds or reconstructed existing ponds be designed and constructed to comply with the groundwater limitations in the Order.
31. Consistent with State Water Resources Control Board Resolution 68-16, this Order requires that all waste from a dairy that is applied to land application areas under the Discharger's control: (1) be managed according to a certified Nutrient Management Plan that is consistent with the technical standards specified in

Attachment C, and (2) not cause groundwater to exceed the groundwater limitations of this Order.

ENVIRONMENTAL STEWARDSHIP PROGRAMS

32. Environmental stewardship programs, such as the California Dairy Quality Assurance Program, and local ordinances can greatly assist the Central Valley Water Board efforts to assure compliance with this Order. Since its inception in 1998, the California Dairy Quality Assurance Program's efforts have resulted in dairy operators having a greater understanding of the need for water quality protection. Recently adopted local ordinances in several counties throughout the Region have also increased dairy operators' understanding of the needs for water quality protection. Dairies that are certified under a quality assurance program approved by the State Water Board or under a County regulatory program approved by the Central Valley Water Board receive a 50 percent reduction in their annual fee.
33. Participation in an Environmental Stewardship Program or operation of a dairy in a county that has a local ordinance regulating dairies may assist an existing dairy facility in meeting the requirements of this Order but these programs are not a substitute for regulation under this Order.

GENERAL FINDINGS

34. This Order does not authorize violation of any federal, state, or local law or regulation.
35. As stated in California Water Code Section 13263(g), the discharge of waste into waters of the state is a privilege, not a right, and this Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.
36. This Order is not a National Pollutant Discharge Elimination System Permit issued pursuant to the Federal Clean Water Act. Coverage under this Order does not exempt a facility from the Clean Water Act. Any facility required to obtain such a permit must notify the Central Valley Water Board.
37. The Findings of this Order, supplemental information and details in the attached Information Sheet, and the administrative record of the Central Valley Water Board relevant to milk cow dairies, were considered in establishing the conditions of discharge.
38. The Central Valley Water Board recognizes that this Order imposes new and more stringent requirements on existing milk cow dairies than they have previously been

required to comply with and that some revisions to this Order may be necessary in the future in order to address issues that are not presently foreseen. The Executive Officer will provide annual updates to the Central Valley Water Board on the overall compliance with the Order and make recommendations for revisions to the Order if necessary.

39. The Central Valley Water Board has notified interested agencies and persons of its intent to issue this Order for discharges of wastes from existing milk cow dairies, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.
40. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the proposal to regulate discharges of wastes from existing milk cow dairies under this Order.
41. Any person affected by this action of the Central Valley Water Board may petition the State Water Board to review this action. The State Water Board must receive the petition within 30 days of the date on which the Central Valley Water Board adopted this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.

IT IS HEREBY ORDERED that, pursuant to California Water Code Sections 13260, 13263, and 13267 and in order to meet the provisions contained in Division 7 of the California Water Code and regulations and policies adopted thereunder; all Dischargers specified by the Central Valley Water Board and all Dischargers that have submitted the appropriate fee and a complete Report of Waste Discharge in response to the Central Valley Water Board's 8 August 2005 request, their agents, successors, and assigns shall comply with the following:

A. PROHIBITIONS

1. The discharge of waste, other than as defined in Finding 13 above, or hazardous waste, as defined in California Water Code Section 13173 and Title 23 CCR Section 2521(a), respectively, is prohibited².
2. Except when authorized by a National Pollutant Discharge Elimination System permit, the direct or indirect discharge of waste and/or storm water from the production area to surface waters is prohibited³.

² Discharges of waste other than as defined in Finding 13 may be covered under other waste discharge requirements.

³ Discharges of pollutants from the production area to waters of the United States may not lawfully occur except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permit coverage is not provided by this Order, but must be obtained separately.

3. The discharge of waste from existing milk cow dairies to surface waters which causes or contributes to an exceedance of any applicable water quality objective in the Basin Plans or any applicable state or federal water quality criteria, or a violation of any applicable state or federal policies or regulations is prohibited⁴.
4. The collection, treatment, storage, discharge or disposal of wastes at an existing milk cow dairy that results in (1) discharge of waste constituents in a manner which could cause degradation of surface water or groundwater except as allowed by this Order, (2) contamination or pollution of surface water or groundwater, or (3) a condition of nuisance (as defined by the California Water Code Section 13050) is prohibited.
5. The disposal of waste not generated by on-site animal production activities is prohibited except where a Report of Waste Discharge for the disposal has been submitted to the Executive Officer and the Central Valley Water Board has issued or waived waste discharge requirements (WDRs).
6. The disposal of dead animals in any liquid manure or process wastewater system is prohibited. The disposal of dead animals at a dairy facility is prohibited except when federal, state or local officials declare a State of Emergency and where all other options for disposal have been pursued and failed and the onsite disposal complies with all state and local policies for disposal of dead animals⁵.
7. All animals shall be prohibited from entering any surface water within the animal confinement area (Title 27 CCR Section 22561).
8. The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner or in a manner not approved by the Executive Officer, is prohibited.
9. The land application of manure or process wastewater to cropland for other than nutrient recycling is prohibited.
10. The discharge of wastewater to surface waters from cropland is prohibited. Irrigation supply water that comes into contact or is blended with waste or wastewater shall be considered wastewater under this Prohibition.

⁴ It is important to note that this General Order prohibits the direct or indirect discharge of waste and/or storm water from the production area to surface waters, the discharge of wastewater to surface waters from cropland, and the discharge of storm water to surface water from a land application area where manure or process wastewater has been applied unless the land application area has been managed consistent with a certified Nutrient Management Plan.

⁵ In an emergency, guidance is provided by the *CAL/EPA Emergency Animal Disease Regulatory Guidance for Disposal and Decontamination* (October 20, 2004).

11. The application of process wastewater to a land application area before, during, or after a storm event that would result in runoff of the applied water is prohibited.
12. The discharge of storm water to surface water from a land application area where manure or process wastewater has been applied is prohibited unless the land application area has been managed consistent with a certified Nutrient Management Plan.
13. The use of manure to construct containment structures or to repair, replace, improve, or raise existing containment structures is prohibited.
14. The direct discharge of wastewater into groundwater via backflow through water supply or irrigation supply wells is prohibited.
15. The expansion of the existing milk cow dairy facility is prohibited⁶.

B. GENERAL SPECIFICATIONS

1. The existing milk cow dairy shall have facilities that are designed, constructed, operated, and maintained to retain all facility process wastewater generated during the storage period (maximum period of time anticipated between land application of process wastewater), together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm (see item II of Attachment B, which is attached to and made part of this Order).
2. In the Sacramento and San Joaquin River Basins, ponds and manured areas at existing milk cow dairies in operation on or before 27 November 1984 shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Existing milk cow dairies that were in operation on or before 27 November 1984 and that are protected against 100-year peak stream flows must continue to provide such protection. Existing milk cow dairies built or expanded after 27 November 1984 shall be protected against 100-year peak stream flows (Title 27 Section 22562(c)).
3. In the Tulare Lake Basin, existing milk cow dairies that existed as of 25 July 1975 shall be protected from inundation or washout from overflow from any stream channel during 20-year peak stream flows and existing milk cow dairies constructed after 25 July 1975 shall be protected from 100-year peak stream flows. Existing milk cow dairies expanded after 8 December 1984 shall be protected from 100-year peak stream flows.

⁶ Dischargers must submit a Report of Waste Discharge, document compliance with CEQA, and obtain coverage under individual waste discharge requirements before any material facility expansion. "Expansion" is defined in Attachment E.

4. Wastes and land application areas shall be managed to prevent contamination of crops grown for human consumption. The term “crops grown for human consumption” refers only to crops that will not undergo subsequent processing which adequately removes potential microbial danger to consumers.
5. Dischargers shall provide an engineering evaluation of an existing pond and propose and implement approved remedial measures when groundwater monitoring demonstrates that the existing pond has adversely impacted groundwater quality.
6. New ponds installed in order to comply with the requirements of this Order (i.e., to increase the storage capacity to meet the existing facility conditions, not related to an expansion) or existing ponds reconstructed for the same purpose shall be designed and constructed to comply with the groundwater limitations in this Order.
7. Pond design must be reviewed and approved by the Executive Officer prior to construction. This Order provides a tiered approach to pond design requirements to provide an option that will significantly reduce the time required for approval by the Executive Officer as defined below:
 - a. Tier 1: A pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with Section 20340 of Title 27) between the two liners will be considered to be consistent with Resolution 68-16. Review for ponds designed to this standard will be conducted in less than 30 days of receipt of a complete design plan package submitted to the Board.
 - b. Tier 2: A pond designed in accordance with California Natural Resource Conservation Service (NRCS) Conservation Practice Standard 313 (as described in the Information Sheet) or equivalent and which the Discharger must demonstrate through submittal of technical reports that the alternative design is protective of groundwater quality as required in General Specification B.8 below.
8. Prior to the enlargement of an existing settling, storage, or retention pond or the construction of any such new pond not associated with an expansion, the Discharger shall submit to the Executive Officer:
 - a. For Tier 1 and 2 pond design, a design report prepared by, or under the direct supervision of, and certified by, a Civil Engineer who is registered pursuant to California law or other person as may be permitted under the

provisions of the California Business and Professions Code to assume responsible charge of such work. The design report shall include the following, as specified in Section II.B of Attachment B to this Order:

- i. Design calculations demonstrating that adequate containment will be achieved,
 - ii. Details on the liner and leachate collection and removal system (if appropriate) materials,
 - iii. A schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of this Order,
 - iv. A construction quality assurance plan describing testing and observations needed to document construction of the pond in accordance with the design and Sections 20323 and 20324 of Title 27, and
 - v. An operations and maintenance plan for the pond.
- b. For Tier 2 pond design, the design report shall also include a technical report and groundwater model that demonstrates the proposed pond is in compliance with the groundwater limitations in this Order, including calculations that demonstrate the amount and quality of seepage from the proposed pond and its effect on groundwater quality, and include proposed groundwater monitoring to evaluate the impact of pond seepage on groundwater quality.

Enlargement of any existing pond or construction of any new pond shall not begin until the Executive Officer notifies the Discharger in writing that the design report is acceptable.

9. Prior to the placement of waste in any enlarged existing settling, storage, or retention pond or any such newly constructed pond, the Discharger shall submit a post construction report prepared by, or under the direct supervision of, and certified by, a Civil Engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work. Waste shall not be placed into the pond until the Executive Officer notifies the Discharger in writing that the post construction report is acceptable. The post construction report shall include: (1) verification that the pond meets the requirements of this Order as specified in General Specification B.7 including documentation of the results of the construction quality assurance testing and observations, (2) certification that the pond was constructed as designed, and (3) as-built diagrams.

10. The level of waste in the process wastewater retention ponds shall be kept a minimum of two (2) feet from the top of each aboveground embankment and a minimum of one (1) foot from the ground surface of each belowground pond. Less freeboard may be approved by the Executive Officer when a Civil Engineer who is registered pursuant to California law, or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work, demonstrates that the structural integrity of the pond will be maintained with the proposed freeboard.
11. Ponds shall be managed and maintained to prevent breeding of mosquitoes and other vectors. In particular,
 - a. Small coves and irregularities shall not be allowed around the perimeter of the water surface;
 - b. Weeds shall be minimized through control of water depth, harvesting, or other appropriate method;
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface; and
 - d. Management shall be in accordance with the requirements of the Mosquito Abatement District.
12. All precipitation and surface drainage from outside of the existing milk cow dairy (i.e., "run on") shall be diverted away from any manured areas unless such drainage is fully contained (Title 27 Section 22562(b)).
13. Ponds designated to contain the 25-year, 24-hour storm event runoff must have a depth marker that clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation from a 25-year, 24-hour storm event.
14. All roofs, buildings, and non-manured areas located in the production area of the existing milk cow dairy shall be constructed or otherwise designed so that clean rainwater is diverted away from manured areas and waste containment facilities, unless such drainage is fully contained in the wastewater retention system (Title 27 Section 22562(b)).
15. Roof drainage from barns, milk houses, or shelters shall not drain into the corrals unless the corrals are properly graded and drained (Title 3 CCR, Division 2, Chapter 1, Article 22, Section 661).

16. The milk parlor, animal confinement area (including corrals), and manure and feed storage areas shall be designed and maintained to convey all water that has contacted animal wastes or feed to the wastewater retention system and to minimize standing water as of 72 hours after the last rainfall and the infiltration of water into the underlying soils.
17. Unlined ditches, swales, and/or earthen-berm channels may not be used for storage of process wastewater, manure, or tailwater and may only be used for conveyance of process wastewater collected in the production area to the retention pond, conveyance of process wastewater from the retention pond to the land application area, irrigation return water management, or temporary control of accidental spills, or rainfall-induced overflows at existing milk cow dairies designed, constructed, operated, and maintained in compliance with General Specification B.1.

C. LAND APPLICATION SPECIFICATIONS

1. Land application of all waste from the facility to areas under the Discharger's control shall be conducted in accordance with a certified Nutrient Management Plan (required in Required Reports and Notices H.1.c below) consistent with the technical standards for nutrient management as specified in Attachment C. The Nutrient Management Plan shall be modified within 90 days if monitoring shows that discharge from the land application fails to comply with the Groundwater Limitations of this Order or surface water quality objectives or criteria. The modifications must be designed to bring Dischargers into compliance with this Order.
2. No later than 31 December 2007, the Discharger shall have a written agreement with each third party that receives process wastewater from the Discharger for its own use. Each written agreement shall be included in the Discharger's Existing Conditions Report, Nutrient Management Plan, and Annual Report. The written agreement(s) shall be effective until the third party is covered under waste discharge requirements or a waiver of waste discharge requirements that are adopted by the Central Valley Water Board. The written agreement shall:
 - a. Clearly identify:
 - i. The Discharger and dairy facility from which the process wastewater originates,
 - ii. The third party that will control the application of the process wastewater to cropland,

- iii. The Assessor's Parcel Number(s) and the acreage(s) of the cropland where the process wastewater will be applied, and
 - iv. The types of crops to be fertilized with the process wastewater.
 - b. Include an agreement by the third party to:
 - i. Use the process wastewater at agronomic rates appropriate for the crops to be grown, and
 - ii. Prevent the runoff to surface waters of wastewater, storm water or irrigation supply water that has come into contact with manure or is blended with wastewater.
 - c. Include a certification statement, as specified in General Reporting Requirements C.7 of the Standard Provision and Reporting Requirements (which is attached to and made part of this Order), which is signed by both the Discharger and third party.
3. Land application of wastes for nutrient recycling from existing milk cow dairies shall not cause the underlying groundwater to contain any waste constituent, degradation product, or any constituent of soil mobilized by the interactions between applied wastes and soil or soil biota, to exceed the groundwater limitations set forth in this Order.
4. The application of animal waste and other materials containing nutrients to any cropland under control of the Discharger shall meet the following conditions:
 - a. The application is in accordance with a certified Nutrient Management Plan developed and implemented in accordance with Required Reports and Notices H.1.c and Attachment C of this Order; and
 - b. Records are prepared and maintained as specified in the Record-Keeping Requirements of Monitoring and Reporting Program No. R5-2007-0035.
5. The application of waste to cropland shall be at rates that preclude development of vectors or other nuisance conditions and meet the conditions of the certified Nutrient Management Plan.
6. Land application areas that receive dry manure shall be managed through implementation of erosion control measures to minimize erosion and must be consistent with a certified Nutrient Management Plan.

7. All process wastewater applied to land application areas must infiltrate completely within 72 hours after application.
8. Process wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified Nutrient Management Plan (see Attachment C).
9. Manure and process wastewater shall not be applied closer than 100 feet to any down gradient surface waters, open tile line intake structures, sinkholes, agricultural or domestic well heads, or other conduits to surface waters, unless a 35-foot wide vegetated buffer or physical barrier is substituted for the 100-foot setback or alternative conservation practices or field-specific conditions will provide pollutant reductions equivalent or better than the reductions achieved by the 100-foot setback.

D. GROUNDWATER LIMITATIONS

1. Discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. The appropriate water quality objectives are summarized in the Information Sheet, which is attached to and part of this Order, and can be found in the Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.) and the Water Quality Control Plan for the Tulare Lake Basin (2nd Ed.).

E. PROVISIONS

1. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies* (Standard Provisions) dated 3 May 2007, which is attached to and made part of this Order.
2. The Discharger shall comply with all applicable provisions of the California Water Code, Title 27 CCR, and the applicable Water Quality Control Plans.
3. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2007-0035 which is part of this Order, and future revisions thereto or with an individual monitoring and reporting program, as specified by the Central Valley Water Board or the Executive Officer.
4. The Discharger shall submit a complete Report of Waste Discharge in accordance with the California Water Code Section 13260 at least 140 days prior to any material change or proposed change in the character, location, or volume of the discharge, including any expansion of the facility or

development of any treatment technology, or construction of an anaerobic digester.

5. If the Preliminary Dairy Facility Assessment⁷ indicates that facility improvements are necessary (see Required Reports and Notices H.1.d), the Discharger shall make continual facility improvements while completing implementation of the Waste Management Plan and/or Nutrient Management Plan.
6. This Order does not apply to facilities where wastes such as, but not limited to, whey, cannery wastes, septage, municipal or industrial sludge, municipal or industrial biosolids, ash or similar types of waste are generated onsite or are proposed to be brought onto the dairy or associated croplands for the purpose of nutrient recycling or disposal. The Discharger shall submit a complete Report of Waste Discharge and receive WDRs or a waste-specific waiver of WDRs from the Central Valley Water Board prior to receiving such waste.
7. If site conditions threaten to violate Prohibition A.2 or Prohibition A.4, the Discharger shall take immediate action to preclude the violation, documenting the condition and all corrective actions. Records of such actions shall be kept and maintained as required in Monitoring and Reporting Program No. R5-2007-0035. Alterations of the Waste Management Plan (see Required Reports and Notices H.1.a) for the production area to avoid a recurrence shall be submitted as a modification to the Waste Management Plan.
8. If a discharge of waste creates, or threatens to create, significant objectionable odors or nuisance odor and vector conditions, enforcement and/or revocation of coverage under this Order may result.
9. The Discharger shall comply with all requirements of this Order and all terms, conditions, and limitations specified by the Executive Officer.
10. Any instance of noncompliance with this Order constitutes a violation of the California Water Code and its regulations. Such noncompliance is grounds for enforcement action, and/or termination of the authorization to discharge.
11. The Discharger must maintain coverage under this Order or a subsequent revision to this Order until all manure, process wastewater, and animal waste impacted soil, including soil within the pond(s), is disposed of or utilized in a manner which does not pose a threat to surface water or groundwater quality or create a condition of nuisance. At least 90 days before desiring to terminate coverage under this Order, the Discharger shall submit to the

⁷ The Preliminary Dairy Facility Assessment is required as part of the Existing Conditions Report (Attachment A).

Executive Officer a closure plan that ensures protection of surface water and groundwater. No more than 30 days after completion of site closure, the Discharger shall submit a closure report which documents that all closure activities were completed as proposed and approved in the closure plan. Coverage under this Order will not be terminated until cleanup is complete.

12. This Order shall become effective upon adoption by the Central Valley Water Board.
13. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in terminating the applicability of this Order to a specific facility or Discharger.
14. Technical reports (Monitoring Well Installation and Sampling Plan, Monitoring Well Installation Completion Report, Groundwater Monitoring Report, Waste Management Plan Certification, and portions of the Waste Management Plan) required by this Order must be certified by an appropriately licensed professional as required in this Order and its Attachments (see Schedule of Tasks J.1 below). If the Executive Officer provides comments on any technical report, the Discharger will be required to address those comments.
15. The Discharger shall maintain a copy of this Order at the site so as to be available at all times to site-operating personnel. The Discharger, landowner and his/her designee shall be familiar with the content of this Order.

F. EFFECTIVE DATE OF COVERAGE UNDER THIS ORDER

1. Coverage under this Order is effective upon notification by the Executive Officer that this Order applies to the Discharger.

G. PERMIT REOPENING, REVISION, REVOCATION, AND RE-ISSUANCE

1. If more stringent applicable water quality standards are adopted in the Basin Plans, the Central Valley Water Board may revise and modify this Order in accordance with such standards.

2. This Order may be reopened to address any changes in state plans, policies, or regulations that would affect the water quality requirements for the discharges and as authorized by state law.
3. The Central Valley Water Board or the Executive Officer may revoke coverage under this Order at any time and require the Discharger to submit a Report of Waste Discharge and obtain individual waste discharge requirements.

H. REQUIRED REPORTS AND NOTICES

1. Dischargers must submit the following in accordance with the Schedule of Tasks J.1:
 - a. **Existing Conditions Report:** The Discharger shall submit an Existing Conditions Report for the dairy facility, prepared in accordance with Attachment A. The Existing Conditions Report shall provide additional information on existing conditions at the dairy that was not provided in the Report of Waste Discharge submitted in response to the Central Valley Water Board's 8 August 2005 request. The Existing Conditions Report requires the Discharger to complete a Preliminary Dairy Facility Assessment. The Preliminary Dairy Facility Assessment is available on the Central Valley Water Board's web site at http://www.waterboards.ca.gov/centralvalley/available_documents/index.html#confined and must be completed electronically. The Discharger shall include a copy of the results of the Preliminary Dairy Facility Assessment in the Existing Conditions Report. Monitoring and Reporting Program No. R5-2007-0035 requires the Discharger to include in each Annual Report an Annual Dairy Facility Assessment, which will provide annual updates to the Preliminary Facility Assessment.
 - b. **Waste Management Plan:** The Discharger shall submit a Waste Management Plan for the production area of the dairy facility, prepared in accordance with Attachment B. The Waste Management Plan shall provide an evaluation of the existing milk cow dairy's design, construction, operation, and maintenance for flood protection and waste containment and whether the facility complies with Prohibition A.14 and General Specifications B.1 through B.3, and B.10 through B.16. If the design, construction, operation, and/or maintenance of the dairy facility does not comply with these specifications and prohibition, the Waste Management Plan must propose modifications and a schedule for modifications that will bring the dairy facility into compliance. Certification that the modifications have been implemented shall be submitted in accordance with the Schedule of Tasks J.1.

- c. **Nutrient Management Plan:** A Discharger who applies manure, bedding, or process wastewater to land for nutrient recycling must develop and implement management practices that control nutrient losses and describe these in a Nutrient Management Plan. The Nutrient Management Plan must be certified as specified in Attachment C, maintained at the dairy, submitted to the Executive Officer upon request and must ultimately provide for protection of both surface water and groundwater. Certification that the Nutrient Management Plan has been completed shall be in accordance with the Schedule of Tasks J.1, shall incorporate the elements specified in Attachment C based on a field-specific assessment of the potential for pollutant transport to surface water and groundwater, and shall be submitted to the Executive Officer. The Nutrient Management Plan shall be updated as specified in the Technical Standards for Nutrient Management in Attachment C or if the Executive Officer requests that additional information be included. Groundwater monitoring will be used to determine if implementation of the Nutrient Management Plan is protective of groundwater quality.
- d. **Proposed Interim Facility Modifications:** A Discharger whose Preliminary Dairy Facility Assessment (see Required Reports and Notices H.1.a above) shows that the Whole Farm Nitrogen Balance⁸ is greater than 1.65 and/or that the existing retention pond(s) total storage capacity is less than the total storage capacity required shall submit Proposed Interim Facility Modifications as Necessary to Balance Nitrogen and/or Proposed Interim Facility Modifications as Necessary to Improve Storage Capacity, respectively. Such Dischargers shall also submit Documentation of Interim Facility Modifications Completion as Necessary for Storage Capacity and to Balance N.
- e. **Salinity Report:** The Discharger shall submit a report that identifies sources of salt in waste generated at the dairy, evaluates measures that can be taken to minimize salt in the dairy waste, and certifies that they will implement the approved measures identified to minimize salt in the dairy waste. If a third party (for example, the California Dairy Quality Assurance Program) produces an industry-wide report that is acceptable to the Executive Officer, the Discharger may refer to that report rather than generating his own report, but must certify that the appropriate measures will be implemented to reduce salt in his dairy waste.

⁸ The Whole Farm Nitrogen Balance is to be determined as the ratio of (total nitrogen in storage – total nitrogen exported + nitrogen imported + irrigation nitrogen + atmospheric nitrogen)/(total nitrogen removed by crops) as reported in the Preliminary Dairy Facility Assessment in the Existing Conditions Report (Attachment A).

2. Reporting Provisions:

- a. All Reports of Waste Discharge, applications, annual reports, or information submitted to the Central Valley Water Board shall be signed and certified in accordance with C. 7 and C.8 of the Standard Provisions.
- b. The Discharger shall submit all reports as specified in the attached Monitoring and Reporting Program No. R5-2007-0035.
- c. Any Discharger authorized to discharge waste under this Order shall furnish, within a reasonable time, any information the Central Valley Water Board may request, to determine whether cause exists for modifying, revoking, and reissuing, or terminating their authorization for coverage under this Order. The Discharger shall, upon request, also furnish to the Central Valley Water Board copies of records required to be kept by this Order.
- d. All reports prepared and submitted to the Executive Officer in accordance with the terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board.

I. RECORD-KEEPING REQUIREMENTS

1. The Discharger shall create, maintain for five years, and make available to the Central Valley Water Board upon request by the Executive Officer any reports or records required by this Order including those required under Monitoring and Reporting Program No. R5-2007-0035.

J. SCHEDULE OF TASKS

1. Dischargers who receive coverage under this Order are required to develop and implement a Waste Management Plan and Nutrient Management Plan and submit an Existing Conditions Report, Proposed Interim Facility Modifications, Salinity Report, Preliminary Infrastructure Needs Checklist, and Annual Reports according to the schedule shown in Table 1. All elements of the Waste Management Plan shall be submitted to the Executive Officer by the deadlines specified in Table 1 and signed and certified by the Discharger as required in Required Reports and Notices H.2.a above and the additional professional specified in Table 1. For the elements of the Nutrient Management Plan, Dischargers shall submit a statement to the Executive Officer by each of the deadlines that the item due has been completed. All statements must be signed and certified by the Discharger as required in Required Reports and Notices H.2.a above and the additional professional specified in Table 1.

2. If changes are made to the required submittals through Central Valley Water Board or Executive Officer review, those changes shall be implemented.
3. Any Discharger may be requested to complete the Nutrient Management Plan and/or Waste Management Plan prior to the due date identified in Table 1 if the Executive Officer has determined the facility presents a significant risk to groundwater or surface water.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 3 May 2007.

PAMELA C. CREEDON, Executive Officer

PAL: 9 May 2007

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0035

GENERAL ORDER
FOR
EXISTING MILK COW DAIRIES

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (CWC) Section 13267. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

This MRP includes Monitoring, Record-Keeping, and Reporting requirements. Monitoring requirements include monitoring of discharges of manure and/or process wastewater, storm water, and tailwater from the production area and land application areas and groundwater monitoring in order to determine if the Discharger's dairy is in compliance with the discharge limitations of Waste Discharge Requirements General Order No. R5-2007-0035 (Order). Discharge monitoring should be infrequent for those dairies that are operating in compliance with the Order.

Monitoring requirements also include monitoring of nutrients applied to, and removed from, land application areas in order for the Discharger to develop and implement a Nutrient Management Plan that will minimize leaching of nutrients and salts to groundwater and transport of these constituents to surface water.

In addition, monitoring requirements include periodic visual inspections of the dairy to ensure the dairy is being operated and maintained to ensure continued compliance with the Order.

This MRP requires the Discharger to keep and maintain records for five years of the monitoring activities for the production and land application areas and to prepare and submit reports containing the results of specified monitoring as indicated below.

Except where indicated, all monitoring must begin immediately. Note that some types of events require that a report be submitted to the Central Valley Water Board within 24 hours (see section C).

Dischargers must follow sampling and analytical procedures approved by the Executive Officer. Approved procedures will be posted on the Board's web site and copies may be obtained by contacting staff. A Discharger may submit alternative procedures for consideration, but must receive written approval from the Executive Officer before using them.

The Discharger shall conduct monitoring, record-keeping, and reporting as specified below.

A. MONITORING REQUIREMENTS

Visual Inspections

Effective immediately, the Discharger shall conduct and record the inspections specified in Table 1 below and maintain records of the results on-site for a period of five years.

Table 1. INSPECTIONS
<p><i>Production Area</i> <u>Weekly during the wet season (1 October to 31 May) and monthly between 1 June and 30 September:</u> Inspect all waste storage areas and note any conditions or changes that could result in discharges to surface water and/or from property under control of the Discharger.</p> <p>Note whether freeboard within each liquid storage structure is less than, equal to, or greater than the minimum required (two feet for above ground ponds and one foot for below ground ponds).</p> <p><u>During and after each significant storm event¹:</u> Visual inspections of storm water containment structures for discharge, freeboard, berm integrity, cracking, slumping, erosion, excess vegetation, animal burrows, and seepage.</p> <p><u>Monthly on the 1st day of each month:</u> Photograph each pond showing the current freeboard on that date. All photos shall be dated and maintained as part of the discharger's record.</p>
<p><i>Land Application Areas</i> <u>Daily when process wastewater is being applied:</u> Inspect the land application area and note: the condition of land application berms including rodent holes, piping, and bank erosion; the presence (or lack) of field saturation, ponding, erosion, runoff (including tailwater discharges from the end of fields, pipes, or other conveyances), and nuisance conditions; and the conditions of any vegetated buffers or alternative conservation practices.</p>

Nutrient Monitoring

Starting no later than 12 months after adoption of this Order, the Discharger shall begin monitoring process wastewater, manure, and plant tissue produced at the facility, soil in each land application area, and irrigation water used on each land application area for the constituents and at the frequency as specified in Table 2 below. This information is for use in conducting nutrient management on the individual land application areas and at the facility on the whole. It must be used to develop and implement the Nutrient Management Plan. The Discharger is encouraged to collect and use additional data, as necessary, to refine nutrient management.

¹ A significant storm event is defined as a storm event that results in continuous runoff of storm water for a minimum of one hour, or intermittent runoff for a minimum of three hours in a 12-hour period.

Table 2. NUTRIENT MONITORING

Process Wastewater

Each application:

Record the volume (gallons or acre-inches) and date of process wastewater application to each land application area.

Quarterly during one application event:

Field measurement of electrical conductivity.

Laboratory analyses for nitrate-nitrogen (only when retention pond is aerated), ammonium-nitrogen, total Kjeldahl nitrogen, total phosphorus, and potassium.

Once within 12 months and annually for two years after groundwater monitoring wells are required:

Laboratory analyses for general minerals (calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride).

Manure

Each application to each land application area:

Record the total volume (cubic yards) applied and density (pounds per cubic foot) or total weight (tons) applied and percent moisture.

Once within 12 months:

Laboratory analyses for general minerals (calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride).

Twice per year:

Laboratory analyses for total nitrogen, total phosphorus, potassium, and density (if volume manure applied is reported) or percent moisture (if weight manure applied is reported).

Each offsite export of manure:

Record the total volume (cubic yards) exported and density (grams per liter) or total weight (tons) exported and percent moisture.

Laboratory analyses for density (if volume manure exported is reported) or percent moisture (if weight manure exported is reported).

Annually:

Record the total dry weight (tons) of manure applied annually to each land application area and the total dry weight (tons) of manure exported offsite.

Plant Tissue

At harvest:

Record the total weight (tons) and percent wet weight or volume (cubic yards) and density (grams per liter) of harvested material removed from each land application area.

Laboratory analyses for total nitrogen, phosphorus, and potassium (expressed on a dry weight basis), and percent wet weight (if weight of harvested material is reported) or density (if volume of harvested material is reported).

The following test is only required if the Discharger wants to add fertilizer in excess of 1.4 times the nitrogen expected to be removed by the harvested portion of the crop (see Attachment C for details): Mid-season, if necessary to assess the need for additional nitrogen fertilizer during the growing season.

Laboratory analyses for total nitrogen, expressed on a dry weight basis.

Table 2. NUTRIENT MONITORING
<p>Soil <u>Beginning in the summer of 2008 and then once every 5 years from each land application area:</u> Laboratory analyses for: Total phosphorus</p> <p><i>The following soil tests are recommended but not required:</i> <u>Spring pre-plant for each crop:</u> Laboratory analyses for: 0 to 1 foot depth: Nitrate-nitrogen and organic matter. 1 to 2 foot depth: Nitrate-nitrogen.</p> <p><u>Fall pre-plant for each crop:</u> Laboratory analyses for: 0 to 1 foot: Electrical conductivity, nitrate-nitrogen, soluble phosphorus, potassium and organic matter. 1 to 2 foot: Nitrate-nitrogen. 2 to 3 foot: Nitrate-nitrogen.</p>
<p><i>Irrigation Water</i>² <u>Each irrigation event for each land application area:</u> Record volume (gallons or acre-inches)³ and source (well or canal) of irrigation water applied and dates applied.</p> <p><u>One irrigation event during each irrigation season during actual irrigation events:</u> For each irrigation water source (well and canal): Electrical conductivity and total nitrogen.⁴ Data collected to satisfy the groundwater monitoring requirements (below) will satisfy this requirement.</p>

Monitoring of Surface Runoff

Effective 1 October 2007, the Discharger shall monitor discharges of manure and/or process wastewater, storm water, and tailwater from the production area and land application area for the constituents and at the frequency as specified in Table 3 below.

Table 3. DISCHARGE MONITORING
<p><i>Unauthorized Discharges (Including Off-Property Discharges) of Manure or Process Wastewater from the Production Area or Land Application Area</i> <u>Daily during each discharge:</u> Record date, time, approximate volume (gallons) or weight (tons), duration, location, source, and ultimate destination of the discharge.</p> <p>Field measurements of the discharge for electrical conductivity, temperature, and pH.</p> <p>Laboratory analyses of the discharge for nitrate-nitrogen, total ammonia-nitrogen, unionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, potassium, total dissolved solids, BOD₅⁵, total suspended solids, and total and fecal coliform.</p>

² The Discharger shall monitor irrigation water (from each water well source and canal) that is used on all land application areas.

³ Initial volume measurements may be the total volume for all land application areas. Volume measurements for each irrigation source for each land application area shall be recorded no later than **1 July 2011**.

⁴ In lieu of sampling the irrigation water, the Discharger may provide equivalent data from the local irrigation district.

⁵ Five-day Biochemical Oxygen Demand.

Table 3. DISCHARGE MONITORING
<p><u>Daily during each discharge to surface water:</u> For surface water upstream⁶ and downstream⁷ of the discharge: Field measurements for electrical conductivity, dissolved oxygen, temperature, and pH.</p> <p>Laboratory analyses for nitrate-nitrogen, total ammonia-nitrogen, unionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, potassium, total dissolved solids, BOD₅, total suspended solids, and total and fecal coliform.</p>
<p><i>Storm Water Discharges to Surface Water from the Production Area</i> <u>Daily during each discharge to surface water:</u> Record date, time, approximate volume, duration, location, source, and ultimate destination of the discharge.</p> <p>For (1) the discharge and surface water (2) upstream and (3) downstream of the discharge: Field measurements of electrical conductivity, temperature, pH, total ammonia-nitrogen, and unionized ammonia-nitrogen.</p> <p>Laboratory analyses for nitrate-nitrogen, turbidity, total phosphorus, and total and fecal coliform.</p>
<p><i>Storm Water Discharges to Surface Water from Each Land Application Area⁸</i> <u>First storm event of the wet season⁹ and during the peak storm season (typically February)¹⁰ each year from one third of the land application areas¹¹ with the land application areas sampled rotated each year¹².</u> Record date, time, approximate volume, duration, location, and ultimate destination of the discharge.</p> <p>Field measurements of the discharge for electrical conductivity, temperature, pH, total ammonia-nitrogen, and unionized ammonia-nitrogen.</p> <p>Laboratory analyses of the discharge for nitrate-nitrogen, phosphorus, turbidity, and total and fecal coliform.</p>

⁶ Upstream samples shall be taken just far enough upstream so as not to be influenced by the discharge.

⁷ Downstream samples shall be taken just far enough downstream where the discharge is blended with the receiving water but not influenced by dilution flows or other discharges.

⁸ Sample locations must be chosen such that the samples are representative of the quality and quantity of storm water discharged.

⁹ This sample shall be taken from the first storm event of the season that produces significant storm water discharge such as would occur during continuous storm water runoff for a minimum of one hour, or intermittent storm water runoff for a minimum of three hours in a 12-hour period.

¹⁰ This sample 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. The sample shall be taken during the first hour of the discharge.

¹¹ One land application area shall be sampled for Dischargers that have one to three land application areas, two land application areas shall be sampled for Dischargers that have four to six land application areas, etc.

¹² 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 based on the previous year's data (see Storm Water Reporting below).

Table 3. DISCHARGE MONITORING
<i>Tailwater Discharges to Surface Water from Land Application Areas</i> ¹³ <u>Each discharge from each land application area where irrigation has occurred less than 60 days after application of manure and/or process wastewater:</u> Record date, time, approximate volume (gallons), duration, location, and ultimate destination of the discharge. Field measurements of discharge for electrical conductivity, temperature, pH, total ammonia-nitrogen, and unionized ammonia-nitrogen. <u>First discharge of the year from any land application area where irrigation has occurred less than 60 days after application of manure and/or process wastewater:</u> Laboratory analyses for nitrate-nitrogen, total phosphorus, and total and fecal coliform.

1. If conditions are not safe for sampling, the Discharger must provide documentation of why samples could not be collected and analyzed. For example, the Discharger may be unable to collect samples during dangerous weather conditions (such as local flooding, high winds, tornados, electrical storms, etc.). However, once the dangerous conditions have passed, the Discharger shall collect a sample of the discharge or, if the discharge has ceased, from the waste management unit from which the discharge occurred.
2. Discharge and surface water sample analyses shall be conducted by a laboratory certified for such analyses by the California Department of Health Services. These laboratory analyses shall 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.
3. All discharges shall be reported as specified in the Reporting Requirements (Priority Reporting of Significant Events and Annual Reporting) below, as appropriate.
4. The rationale for all discharge sampling locations shall be included in the Annual Report (in Storm Water Report for storm water discharges from land application areas).
5. Parties interested in coordinating or combining surface water monitoring conducted by an individual dairy or group of dairies with monitoring conducted pursuant to the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R5-2006-0053 for Coalition Group or Order No. R5-2006-0054 for Individual Discharger, or updates thereto) may propose an alternative monitoring program for the Executive Officer's consideration. The alternative program shall not begin until the Discharger receives written approval from the Executive Officer.

¹³ Tailwater samples shall be collected at the point of discharge to surface water.

Groundwater Monitoring

Beginning within six months of adoption of the Order, the Discharger shall sample each domestic and agricultural supply well and subsurface (tile) drainage system present in the production and/or land application areas to characterize existing groundwater quality. This monitoring shall be conducted at the frequency and for the parameters specified in Table 4 below.

Table 4. GROUNDWATER MONITORING
<i>Domestic and Agricultural Supply Wells</i> <u>Annually:</u> Field measurements of electrical conductivity. Laboratory analyses of nitrate-nitrogen.
<i>Subsurface (Tile) Drainage System</i> <u>Annually:</u> Field measurements of electrical conductivity. Laboratory analyses of nitrate-nitrogen and total phosphorus.

1. Groundwater samples from domestic wells shall be collected from the tap nearest to the pressure tank (and before the pressure tank if possible) after water has been pumped from this tap for 10 to 20 minutes. Groundwater samples from agricultural supply wells shall be collected after the pump has run for a minimum of 30 minutes or after at least three well volumes have been purged from the well. Samples from subsurface (tile) drains shall be collected at the discharge point into a canal or drain.

General Monitoring Requirements

1. The Discharger shall comply with all the "Requirements Specifically for Monitoring Programs and Monitoring Reports" as specified in the Standard Provisions and Reporting Requirements.
2. Approved sampling procedures are listed on the Central Valley Water Board's web site at http://www.waterboards.ca.gov/centralvalley/available_documents/index.html#confined. When special procedures appear to be necessary at an individual dairy, the Discharger may request approval of alternative sampling procedures for nutrient management. The Executive Officer will review such requests and if adequate justification is provided, may approve the requested alternative sampling procedures.
3. The Discharger shall use clean sample containers and sample handling, storage, and preservation methods that are accepted or recommended by the selected analytical laboratory or, as appropriate, in accordance with approved United States Environmental Protection Agency analytical methods.

4. All samples collected shall be representative of the volume and nature of the material being sampled.
5. All samples containers shall be labeled and records maintained to show the time and date of collection as well as the person collecting the sample and the sample location.
6. All samples collected for laboratory analyses shall be preserved and submitted to the laboratory within the required holding time appropriate for the analytical method used and the constituents analyzed.
7. All samples submitted to a laboratory for analyses shall be identified in a properly completed and signed Chain of Custody form.
8. Field test instruments used for pH, electrical conductivity and dissolved oxygen 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.

B. RECORD-KEEPING REQUIREMENTS

Dischargers shall maintain on-site for a period of five years from the date they are created all information as follows:

1. All information necessary to document implementation and management of the minimum elements of the nutrient management plan (NMP);
2. All records for the production area including:
 - a. Records documenting the inspections required under the Monitoring Requirements above;
 - b. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction;

- c. Records of the date, time, and estimated volume of any overflow;
 - d. Records of mortality management and practices;
 - e. Steps and dates when action is taken to correct unauthorized releases as reported in accordance with Priority Reporting of Significant Events below; and
 - f. Records of monitoring activities and laboratory analyses conducted as required in Standard Provisions and Reporting Requirements D.5.
3. All records for the land application area including:
- a. Expected and actual crop yields;
 - b. Identification of crop, acreage, and dates of planting and harvest for each field;
 - c. Dates, locations, and approximate weight and moisture content, or volume and density, of manure applied to each field;
 - d. Dates, locations, and volume of process wastewater applied to each field;
 - e. Weather conditions at time of manure and process wastewater applications and for 24 hours prior to and following applications;
 - f. Records documenting the inspections conducted as required under the Monitoring Requirements above;
 - g. Dates, locations, and test methods for soil, manure, process wastewater, irrigation water, and plant tissue sampling;
 - h. Results from manure, process wastewater, irrigation water, soil, plant tissue, discharge (including tailwater), and storm water sampling;
 - i. Explanation for the basis for determining manure or process wastewater application rates, as provided in the Technical Standards for Nutrient Management established by the Order (Attachment C);
 - j. Calculations showing the total nitrogen, phosphorus, and potassium to be applied to each field, including sources other than manure or process wastewater;

- k. Total amount of nitrogen, phosphorus, and potassium actually applied to each field, including documentation of calculations for the total amount applied;
 - l. The method(s) used to apply manure and/or process wastewater;
 - m. Dates of manure and/or process wastewater application equipment inspections;
 - n. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction; and
 - o. Records of monitoring activities and laboratory analyses conducted as required in Standard Provisions and Reporting Requirements D.5.
- 4. A copy of the Discharger's site-specific NMP;
 - 5. All Manure/Process Wastewater Tracking Manifest forms (Attachment D) which includes information on the manure hauler, destination of the manure, dates hauled, amount hauled, and certification; and
 - 6. All analyses of manure, process wastewater, irrigation water, soil, plant tissue, discharges (including tailwater discharges), surface water, storm water, subsurface (tile) drainage, and groundwater.

C. REPORTING REQUIREMENTS

Priority Reporting of Significant Events (Prompt Action Required)

The Discharger shall report any noncompliance that endangers human health or the environment or any noncompliance with Prohibitions A.1, A.2, A.3, A.4, A.5, A.8, A.9, A.10, A.11, and A.12 in the Order, **within 24 hours** of becoming aware of its occurrence. The incident shall be reported to the Central Valley Water Board Office, local environmental health department, and to the California Office of Emergency Services (OES). During non-business hours, the Discharger shall leave a message on the Central Valley Water Board's voice mail. The message shall include the time, date, place, and nature of the noncompliance, the name and number of the reporting person, and shall be recorded in writing by the Discharger. The OES is operational 24 hours a day. A written report shall be submitted to the Central Valley Water Board office **within two weeks** of the Discharger becoming aware of the incident. The report shall contain a description of the noncompliance,

its causes, duration, and the actual or anticipated time for achieving compliance. The report shall include complete details of the steps that the Discharger has taken or intends to take, in order to prevent recurrence. All intentional or accidental spills shall be reported as required by this provision. The written submission shall contain:

1. The approximate date, time, and location of the noncompliance including a description of the ultimate destination of any unauthorized discharge and the flow path of such discharge to a receiving water body;
2. A description of the noncompliance and its cause;
3. The flow rate, volume, and duration of any discharge involved in the noncompliance;
4. The amount of precipitation (in inches) the day of any discharge and for each of the seven days preceding the discharge;
5. A description (location; date and time collected; field measurements of pH, temperature, dissolved oxygen and electrical conductivity; sample identification; date submitted to laboratory; analyses requested) of noncompliance discharge samples and/or surface water samples taken to comply with the Monitoring Requirements above for *Unauthorized Discharges (Including Off-Property Discharges) of Manure or Process Wastewater From the Production Area or Land Application Area and Storm Water Discharges to Surface Water from the Production Area*;
6. The period of noncompliance, including dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue;
7. A time schedule and a plan to implement corrective actions necessary to prevent the recurrence of such noncompliance; and
8. The laboratory analyses of the noncompliance discharge sample and/or upstream and downstream surface water samples shall be submitted to the Central Valley Water Board office within 45 days of the discharge.

Annual Reporting

An annual monitoring report is due by **1 July of each year** beginning **1 July 2008**. It will consist of a General Section, Groundwater Reporting Section and a Storm Water Reporting Section, as described below.

General Section

The General section of the annual report shall be completed on an annual report form provided by the Executive Officer (available on the Central Valley Water Board website at http://www.waterboards.ca.gov/centralvalley/available_documents/index.html#confined) and shall include all the information as specified below. This section of the annual report shall cover information on crops harvested during the previous calendar year, whether or not the crop was planted prior to this period.

1. Identification of the beginning and end dates of the annual reporting period;
2. An Annual Dairy Facility Assessment (an update to the Preliminary Dairy Facility Assessment in Attachment A) using the tool provided by the Executive Officer or any future revisions thereto;
3. Number and type of animals, whether in open confinement or housed under roof;
4. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) generated by the facility during the annual reporting period and a calculation of the nitrogen, phosphorus, potassium and total salt content of this waste;
5. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) applied to each land application area during the annual reporting period and a calculation of the nitrogen, phosphorus, potassium and total salt content of this waste;
6. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) transferred to other persons by the facility during the annual reporting period and a calculation of the nitrogen, phosphorus, potassium and total salt content of this waste;
7. Total number of acres and the Assessor Parcel Numbers for all land application areas;
8. Total number of acres and the Assessor Parcel Numbers of property that were used for land application of manure and process wastewater during the annual reporting period;
9. Summary of all manure and process wastewater discharges from the production area to surface water or to land areas (land application areas or otherwise) when not in accordance with the facility's Nutrient Management Plan that occurred during the annual reporting period, including date, time,

- location, approximate volume, a map showing discharge and sample locations, rationale for sample locations, and method of measuring discharge flows;
10. Summary of all storm water discharges from the production area to surface water during the annual reporting period, including the date, time, approximate volume, duration, location, and a map showing the discharge and sample locations, rationale for sample locations, and method of measuring discharge flows;
 11. Summary of all discharges from the land application area to surface water that have occurred during the annual reporting period, including the date, time, approximate volume, location, source of discharge (i.e., tailwater, process wastewater, or blended process wastewater), a map showing the discharge and sample locations, rationale for sample locations, and method of measuring discharge flows;
 12. A statement indicating if the NMP has been updated and whether the current version of the facility's NMP was developed or approved by a certified nutrient management planner as specified in Attachment C of the Order;
 13. Copies of all manure/process wastewater tracking manifests for the reporting period;
 14. Copies of all written agreements with each third party that receives solid manure or process wastewater from the Discharger for its own use;
 15. Copies of laboratory analyses of all discharges (manure, process wastewater, or tailwater), surface water (upstream and downstream of a discharge), and storm water, including chain-of-custody forms and laboratory quality assurance/quality control results;
 16. Tabulated analytical data for samples of manure, process wastewater, irrigation water, soil, and plant tissue. The data shall be tabulated to clearly show sample dates, constituents analyzed, constituent concentrations, and detection limits; and
 17. Results of the Record-Keeping Requirements for the production and land application areas specified in Record-Keeping Requirements B.2.b, B.2.c, B.3.a, B.3.b, B.3.c, B.3.d, B.3.e, B.3.k, and B.3.n above.

Groundwater Reporting Section

Groundwater monitoring results shall be included with the annual reports.

1. Dischargers that monitor supply wells and subsurface (tile) drainage systems only shall submit information on the location of sample collection and all field and laboratory data, including all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results).
2. Dischargers that have monitoring well systems shall include all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results) and tabular and graphical summaries of the monitoring data. Data shall be tabulated to clearly show the sample dates, constituents analyzed, constituent concentrations, detection limits, depth to groundwater, and groundwater elevations. Graphical summaries of groundwater gradients and flow directions shall also be included. Each groundwater monitoring report shall include a summary data table of all historical and current groundwater elevations and analytical results. The groundwater monitoring reports shall be certified by a California registered professional as specified in General Reporting Requirements C.9 of the Standard Provisions and Reporting Requirements of the Order.

Storm Water Reporting Section

Storm water monitoring results will be included in the annual report. The report shall include a map showing all sample locations for all land application areas, rationale for all sampling locations, a discussion of how storm water flow measurements were made, the results (including the laboratory analyses, chain of custody forms, and laboratory quality assurance/quality control results) of all samples of storm water, and any modifications made to the facility or sampling plan in response to pollutants detected in storm water. The annual report must also include documentation if no significant discharge of storm water occurred from the land application area(s) or if it was not possible to collect any of the required samples or perform visual observations due to adverse climatic conditions.

If the storm water monitoring for any land application area indicates pollutants have not been detected in storm water samples, the Discharger may propose to the Executive Officer to reduce the constituents and/or sampling frequency for that area.

General Reporting Requirements

1. The results of any monitoring conducted more frequently than required at the locations specified herein shall be reported to the Central Valley Water Board.
2. Laboratory analyses for manure, process wastewater, and soil shall be submitted to the Central Valley Water Board upon request by the Executive Officer.

3. Each report shall be signed by the Discharger or a duly authorized representative as specified in the General Reporting Requirements C.7 of the Standard Provisions and Reporting Requirements (SPRR), and shall contain the following statement:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

4. For facilities in Fresno, Kern, Kings, Madera, Mariposa, and Tulare counties, submit reports to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706
Attention: Confined Animal Regulatory Unit

For facilities in Butte, Lassen, Modoc, Plumas, Tehama, and Shasta counties, submit reports to:

California Regional Water Quality Control Board
Central Valley Region
415 Knollcrest Drive, Suite 100
Redding, CA 96002
Attention: Confined Animal Regulatory Unit

For facilities in all other counties, submit reports to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670
Attention: Confined Animal Regulatory Unit

ORDERED BY:

PAMELA C. CREEDON, Executive Officer

Date

**MONITORING AND REPORTING PROGRAM ORDER NO. R5-2007-0035
ATTACHMENT A**

**Additional Groundwater Monitoring,
Monitoring Well Installation And Sampling Plan
And
Monitoring Well Installation Completion Report
For
Existing Milk Cow Dairies**

A. Additional Groundwater Monitoring

The Executive Officer has authority pursuant to California Water Code Section 13267 to order Dischargers to implement monitoring and reporting programs. Pursuant to Section 13267, the Executive Officer will order Dischargers to install monitoring wells to comply with Monitoring and Reporting Program Order No. R5-2007-0035 based on an evaluation of the threat to water quality at each dairy. It is anticipated that this will occur in phases of approximately 100 to 200 dairies per year. The first group of dairies ordered to install groundwater monitoring wells will be those dairies where nitrate-nitrogen is detected at 10 mg/l or more in any one domestic well, agricultural well, or subsurface (tile) drainage system in the vicinity of the dairy. If necessary, the Executive Officer will further prioritize these groundwater monitoring requirements based on the factors in Table 5 below. Pursuant to Section 13267, the Executive Officer may order implementation of a monitoring and reporting program at a dairy at any time. Such order may occur, for instance, if violations of the General Order are documented and/or the dairy is found to be in an area where site conditions and characteristics pose a high risk to groundwater quality.

1. When ordered by the Executive Officer, the Discharger shall install sufficient monitoring wells to:
 - a. Characterize groundwater flow direction and gradient beneath the site;
 - b. Characterize natural background (unaffected by the Discharger or others) groundwater quality upgradient of the facility; and
 - c. Characterize groundwater quality downgradient of the corrals, downgradient of the retention ponds, and downgradient of the land application areas.
2. It may be necessary to install more than one upgradient monitoring well (i.e., for the production area and the land application area). The Executive Officer may order more extensive monitoring based on site-specific conditions.

Attachment A

Existing Milk Cow Dairies

TABLE 5. GROUNDWATER MONITORING FACTORS FOR RANKING PRIORITY¹			
FACTOR	SITE CONDITION	POINTS	SCORE
Highest nitrate concentration (nitrate-nitrogen in mg/l) in any existing domestic well, agricultural supply well, or subsurface (tile) drainage system at the dairy or associated land application area.*	< 10	0	
	10 - 20	10	
	>20	20	
Location of production area or land application area relative to a Department of Pesticide Groundwater Protection Area ² (GWPA).	Outside GWPA	0	
	In GWPA	20	
Distance (feet) of production area or land application area from an artificial recharge area ³ as identified in the California Department of Water Resources Bulletin 118 or by the Executive Officer.	> 1,500	0	
	601 to 1,500	10	
	0 to 600	20	
Nitrate concentration (nitrate-nitrogen in mg/l) in domestic well on property adjacent to the dairy production area or land application area (detected two or more times).	< 10 or unknown	0	
	10 or greater	20	
Distance (feet) from dairy production area or land application area and the nearest off-property domestic well.*	> 600	0	
	301 to 600	10	
	0 to 300	20	
Distance (feet) from dairy production area or land application area and the nearest off-property municipal well.*	> 1,500	0	
	601 to 1,500	10	
	0 to 600	20	
Number of crops grown per year per field.*	1	5	
	2	10	
	3	15	
Nutrient Management Plan completed by 1 July 2009 *	Yes	0	
	No	100	
Whole Farm Nitrogen Balance. ^{4*}	<1.65	0	
	1.65 to 3	10	
	>3	20	

Total Score: _____

*This information will be provided by the Discharger. All other information will be obtained by the Executive Officer.

¹ Information on each factor may not be available for each facility. Total scores will be the ratio of the points accumulated to the total points possible for each facility. Dairies with higher total scores will be directed to install monitoring wells first.

² The Department of Pesticide Regulation (DPR) defines a Groundwater Protection Area (GWPA) as an area of land that is vulnerable to the movement of pesticides to groundwater according to either leaching or runoff processes. These areas include areas where the depth to groundwater is 70 feet or less. The DPR GWPA's can be seen on DPR's website at <http://www.cdpr.ca.gov/docs/gwp/gwpamaps.htm>.

³ An artificial recharge area is defined as an area where the addition of water to an aquifer is by human activity, such as putting surface water into dug or constructed spreading basins or injecting water through wells.

⁴ The Whole Farm Nitrogen Balance is to be determined as the ratio of (total nitrogen in storage – total nitrogen exported + nitrogen imported + irrigation nitrogen + atmospheric nitrogen)/(total nitrogen removed by crops) as reported in the Preliminary Dairy Facility Assessment in the Existing Conditions Report (Attachment A).

Attachment A

Existing Milk Cow Dairies

After 24 months, 100 points will be added if the preparation or implementation of the nutrient management plan is behind schedule.

3. Prior to installation of monitoring wells, the Discharger shall submit to the Executive Officer a Monitoring Well Installation and Sampling Plan (MWISP) (see below) and schedule prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. Installation of monitoring wells shall not begin until the Executive Officer notifies the Discharger in writing that the MWISP is acceptable.
4. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the well from acting as a conduit for pollutant/contaminant transport. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples of the first encountered groundwater.
5. The construction and destruction of monitoring wells and supply wells shall be in accordance with the standards under *Water Wells* and *Monitoring Wells* in the *California Well Standards Bulletin 74-90 (June 1991)* and *Bulletin 74-81 (December 1981)*, adopted by the Department of Water Resources (DWR). Should any county or local agency adopt more stringent standards than that adopted by the DWR, then these local standards shall supercede the Well Standard of DWR, and the Discharger shall comply with the more stringent standards.
6. The horizontal and vertical position of each monitoring well shall be determined by a registered land surveyor or other qualified professional. The horizontal position of each monitoring well shall be measured with one-foot lateral accuracy using the North American Datum 1983 (NAD83 datum). The vertical elevations of each monitoring well shall be referenced to the North American Vertical Datum 1988 (NAVD88 datum) to an absolute accuracy of at least 0.5 feet and a relative accuracy between monitoring wells of 0.01 feet.
7. Within 45 days after completion of any monitoring well, the Discharger shall submit to the Executive Officer a Monitoring Well Installation Completion Report (MWICR) (see below) prepared, by or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology.
8. The Discharger shall sample monitoring wells for the constituents and at the frequency as specified in Table 6 below. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest water table levels.

Table 6. ADDITIONAL GROUNDWATER MONITORING
<i>Monitoring Wells</i>
<u>Semi-annually:</u> Measurement of the depth to groundwater from a surveyed reference point to the nearest 0.010 foot in each monitoring well.
Field measurements of electrical conductivity and pH.
Laboratory analyses for nitrate and ammonia.
<u>Within six months of well construction and every five years thereafter:</u> Laboratory analyses for general minerals (calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride).

9. Groundwater samples from monitoring wells shall be collected as specified in an approved Monitoring Well Installation and Sampling Plan.
10. The Discharger shall submit to the Executive officer an evaluation of the groundwater monitoring data within six months of obtaining sufficient data to evaluate trends in the data (usually about 8 independent samples). The submittal shall include a description of the statistical or non-statistical methods used in evaluating the groundwater monitoring data. The evaluation must use methods approved by the Executive Officer.

B. Monitoring Well Installation and Sampling Plan

At a minimum, the MWISP must contain all of the information listed below.

1. General Information:
 - a. Topographic map showing any existing nearby (about 2000 feet) domestic, irrigation, and municipal supply wells and monitoring wells known to the Discharger, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features, as appropriate.
 - b. Site plan showing proposed well locations, other existing wells, unused and/or abandoned wells, major physical site structures (such as corrals, freestall barns, milking barns, feed storage areas, etc.), waste handling facilities (including solid separation basins, retention ponds, manure storage areas), irrigated cropland and pasture, and on-site surface water features.
 - c. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater.

Attachment A

Existing Milk Cow Dairies

- d. Local permitting information (as required for drilling, well seals, boring/well abandonment).
 - e. Drilling details, including methods and types of equipment for drilling and logging activities. Equipment decontamination procedures (as appropriate) should be described.
 - f. Health and Safety Plan.
2. Proposed Drilling Details:
- a. Drilling techniques.
 - b. Well logging method.
3. Proposed Monitoring Well Design: All proposed well construction information must be displayed on a construction diagram or schematic to identify the following:
- a. Well depth.
 - b. Borehole depth and diameter.
 - c. Well construction materials.
 - d. Casing material and diameter – include conductor casing, if appropriate.
 - e. Location and length of perforation interval, size of perforations, and rationale.
 - f. Location and thickness of filter pack, type and size of filter pack material, and rationale.
 - g. Location and thickness of bentonite seal.
 - h. Location, thickness, and type of annular seal.
 - i. Surface seal depth and material.
 - j. Type of well cap(s).
 - k. Type of well surface completion.
 - l. Well protection devices (such as below-grade water tight-vaults, locking steel monument, bollards, etc.).

4. Proposed Monitoring Well Development:
 - a. Schedule for development (at least seven days after well completion).
 - b. Method of development.
 - c. Method of determining when development is complete.
 - d. Parameters to be monitored during development.
 - e. Method for storage and disposal of development water.
5. Proposed Surveying:
 - a. How horizontal and vertical position of each monitoring well will be determined.
 - b. The accuracy of horizontal and vertical measurements to be obtained.
 - c. The California licensed professional (licensed land surveyor or civil engineer) to perform the survey.
6. Proposed Groundwater Monitoring:
 - a. Schedule (at least 48 hours after well development).
 - b. Depth to groundwater measuring equipment (e.g., electric sounder or chalked tape capable of ± 0.01 -foot measurements).
 - c. Well purging method, equipment, and amount of purge water.
 - d. Sample collection (e.g., bottles and preservation methods), handling procedures, and holding times.
 - e. Quality assurance/quality control (QA/QC) procedures (as appropriate).
 - f. Analytical procedures.
 - g. Equipment decontamination procedures (as appropriate).
7. Proposed Schedule:
 - a. Fieldwork.

- b. Laboratory analyses.
- c. Report submittal.

C. Monitoring Well Installation Completion Report

At a minimum, the MWICR shall summarize the field activities as described below.

1. General Information:

- a. Brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
- b. Topographic map showing any existing nearby domestic, irrigation, and municipal supply wells and monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features.
- c. Site plan showing monitoring well locations, other existing wells, unused and/or abandoned wells, major physical site structures (such as corrals, freestall barns, milking barns, feed storage areas, etc.), waste handling facilities (including solid separation basins, retention ponds, manure storage areas), land application area(s), and on-site surface water features.
- d. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).

2. Monitoring Well Construction:

- a. Number and depths of monitoring wells installed.
- b. Monitoring well identification (i.e., numbers).
- c. Date(s) of drilling and well installation.
- d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
- e. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
- f. Name of drilling company, driller, and logger (site geologist to be identified).

- g. Driller's/Lithologic log.
- h. As-builts for each monitoring well with the following details:
 - i. Well identification.
 - ii. Total borehole and well depth.
 - iii. Date of installation.
 - iv. Boring diameter.
 - v. Casing material and diameter (include conductor casing, if appropriate).
 - vi. Location and thickness of slotted casing, perforation size.
 - vii. Location, thickness, type, and size of filter pack.
 - viii. Location and thickness of bentonite seal.
 - ix. Location, thickness, and type of annular seal.
 - x. Depth of surface seal.
 - xi. Type of well cap.
 - xii. Type of surface completion.
 - xiii. Depth to water (note any rises in water level from initial measurement) and date of measurement.
 - xiv. Well elevation (measuring point to nearest ± 0.01 foot) at top of casing.
 - xv. Well protection device (such as below-grade water tight vaults, stovepipe, bollards, etc).
- i. All depth to groundwater measurements during field program.
- j. Field notes from drilling, installation, and surveying activities (e.g., all subcontractor dailies, as appropriate).
- k. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.

3. Monitoring Well Development:
 - a. Date(s) and time of development.
 - b. Name of developer.
 - c. Method of development.
 - d. Methods used to identify completion of development.
 - e. Development log: volume of water purged and measurements of temperature, pH and electrical conductivity during and after development.
 - f. Disposal of development water.
 - g. Field notes (such a bailing to dryness, recovery time, number of development cycles).

4. Monitoring Well Survey:
 - a. Identify coordinate system or reference points used.
 - b. Description of measuring points (i.e. ground surface, top of casing, etc.).
 - c. Horizontal and vertical coordinates of well casing with cap removed.
 - d. Name, license number, and signature of California licensed professional who conducted survey.
 - e. Surveyor's field notes.
 - f. Tabulated survey data.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

**STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR**

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035
FOR
EXISTING MILK COW DAIRIES
3 May 2007**

A. Introduction:

1. These Standard Provisions and Reporting Requirements (SPRR) are applicable to existing milk cow dairies that are regulated pursuant to the provisions of Title 27 California Code of Regulations (CCR) Division 2, Subdivision 1, Chapter 7, Subchapter 2, Sections 22560 et seq.
2. Any violation of the Order constitutes a violation of the California Water Code and, therefore, may result in enforcement action.
3. If there is any conflicting or contradictory language between the Order, the Monitoring and Reporting Program (MRP) associated with the Order, or the SPRR, then language in the Order shall govern over the MRP and the SPRR, and language in the MRP shall govern over the SPRR.

B. Standard Provisions:

1. The requirements prescribed in the Order do not authorize the commission of any act causing injury to the property of another, or protect the Discharger from liabilities under federal, state, or local laws.
2. The Discharger shall comply with all federal, state, county, and local laws and regulations pertaining to the discharge of wastes from the facility that are at least as stringent as the requirements of the Order.
3. All discharges from the facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or to other courses under their jurisdiction that are at least as stringent as the requirements of the Order.
4. The Order does not convey any property rights or exclusive privileges.
5. The provisions of the Order are severable. If any provision of the Order is held invalid, the remainder of the Order shall not be affected.
6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with the Order. Such steps

shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.

7. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the Order shall not be a defense for violations of the Order by the Discharger.
8. The filing of a request by the Discharger for modification, revocation and reissuance, or termination of the Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of the Order.
9. The Order is not transferable to any person except after notice to the Central Valley Water Board. The Central Valley Water Board may modify or revoke and reissue the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the California Water Code.
10. The Discharger shall provide to the Executive Officer, within a reasonable time, any information which the Executive Officer may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the Discharger's coverage under the Order or to determine compliance with the Order. The Discharger shall also provide to the Executive Officer upon request, copies of records required by the Order to be kept.
11. After notice and opportunity for a hearing, the Order may be terminated or modified for cause, including but not limited to:
 - a. Violation of any term or condition contained in the Order;
 - b. Obtaining the Order by misrepresentation, or failure to disclose fully all relevant facts;
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or
 - d. A material change in the character, location, or volume of discharge.
12. The Order may be modified if new state statutes or regulations are promulgated, and if more stringent applicable water quality standards are approved pursuant to Title 27 of the CCR, or as adopted into the Central Valley Water Board *Water Quality Control Plans (Basin Plans) for the Sacramento River and San Joaquin River Basins (4th Ed)*, and for the *Tulare Lake Basin (2nd Ed.)*. The Order may also be modified for incorporation of land application plans, and/or changes in the waste application to cropland.
13. The Central Valley Water Board may review and revise the Order at any time upon application of any affected person or by motion of the Regional Board.

14. The Discharger shall ensure compliance with existing and/or future promulgated standards that apply to the discharge.
15. The Discharger shall permit representatives of the Central Valley Water Board and the State Water Resources Control Board (State Water Board), upon presentations of credentials at reasonable hours, to:
 - a. Enter premises where wastes are treated, stored, or disposed and where any records required by the Order are kept;
 - b. Copy any records required to be kept under terms and conditions of the Order;
 - c. Inspect facilities, equipment (monitoring and control), practices, or operations regulated or required by the Order; and
 - d. Sample, photograph, and/or video tape any discharge, waste, waste management unit, or monitoring device.
16. The Discharger shall properly operate and maintain in good working order any facility, unit, system, or monitoring device installed to achieve compliance with the Order. Proper operation and maintenance includes best practicable treatment and controls, and the appropriate quality assurance procedures.
17. Animal waste storage areas and containment structures shall be designed, constructed, and maintained to limit, to the greatest extent possible, infiltration, inundation, erosion, slope failure, washout, overtopping, by-pass, and overflow.
18. Setbacks or separation distances contained under Water Wells, Section 8, Part II, in the *California Well Standards, Supplemental Bulletin 74-90 (June 1991)*, and *Bulletin 94-81 (December 1981)*, California Department of Water Resources (DWR), shall be maintained for the installation of all monitoring wells and groundwater supply wells at existing dairies. A setback of 100 feet is required between supply wells and animal enclosures in the production area. A minimum setback of 100 feet, or other control structures (such as housing, berming, grading), shall be required for the protection of existing wells or new wells installed in the cropland. If a county or local agency adopts more stringent setback standards than that adopted by the DWR, then these local standards shall carry precedence over the Well Standards of DWR, and the Discharger shall comply with the more stringent standards.
19. Following any storm event that causes the freeboard of any wastewater holding pond to be less than one (1) foot for below-grade ponds, or two (2) feet for above-grade ponds, the Discharger shall take action as soon as possible to provide the appropriate freeboard in the wastewater holding pond.

20. For any electrically operated equipment at the facility, the failure of which would cause loss of control or containment of waste materials, or violation of this Order, the Discharger shall employ safeguards to prevent loss of control over wastes or violation of this Order. Such safeguards may include alternate power sources, standby generators, standby pumps, additional storage capacity, modified operating procedures, or other means.

C. General Reporting Requirements:

1. The Discharger shall give at least 60 days advance notice to the Central Valley Water Board of any planned changes in the ownership or control of the facility.
2. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of the Order by letter at least 60 days in advance of such change, a copy of which shall be immediately forwarded to the appropriate Central Valley Water Board office listed below in the General Reporting Requirements C.11.
3. To assume operation under the Order, any succeeding owner or operator must request, in writing, that the Executive Officer transfer coverage under the Order. The Central Valley Water Board will provide a form for this request that will allow the succeeding owner or operator to provide their full legal name, address and telephone number of the persons responsible for contact with the Central Valley Water Board and a responsibility statement and a signed statement in compliance with General Reporting Requirement C.7 below. The form will also include a statement for signature that the new owner or operator assumes full responsibility for compliance with the Order and that the new owner or operator will implement the Waste Management Plan and the NMP prepared by the preceding owner or operator. Transfer of the Order shall be approved or disapproved in writing by the Executive Officer. The succeeding owner or operator is not authorized to discharge under the Order and is subject to enforcement until written approval of the coverage transfer from the Executive Officer.
4. The Executive Officer may require the Discharger to submit technical reports pursuant to the Order and California Water Code Section 13267.
5. The Discharger shall identify any information that may be considered to be confidential under state law and not subject to disclosure under the Public Records Act. The Discharger shall identify the basis for confidentiality. If the Executive Officer cannot identify a reasonable basis for treating the information as confidential, the Executive Officer will notify the Discharger that the information will be placed in the public file unless the Central Valley Water Board receives, within 10 calendar days, a written request from the Discharger to keep the information confidential containing a satisfactory explanation supporting the information's confidentiality.

6. Except for data determined to be exempt from disclosure under the Public Records Act (California Government Code Sections 6275 to 6276), and data determined to be confidential under Section 13267(b)(2) of the California Water Code, all reports prepared in accordance with the Order and submitted to the Executive Officer shall be available for public inspection at the offices of the Central Valley Water Board. Data on waste discharges, water quality, meteorology, geology, and hydrogeology shall not be considered confidential.
7. All technical reports and monitoring program reports shall be accompanied by a cover letter with the certification specified in C.8 below and be signed by a person identified below:
 - a. For a sole proprietorship: by the proprietor;
 - b. For a partnership: by a general partner;
 - c. For a corporation: by a principal executive officer of at least the level of senior vice-president; or
 - d. A duly authorized representative if:
 - (1) The authorization is made in writing by a person described in Subsection a, b, or c of this provision;
 - (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the facility, such as the position of manager. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and
 - (3) The written authorization is submitted to the Central Valley Water Board.
8. Each person, as specified in C.7 above, signing a report required by the Order or other information requested by the Central Valley Water Board shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”
9. In addition to Item C.7 above, all technical reports required in the Order that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by, or

under the direction of, and signed by persons registered to practice in California pursuant to California Business and Professions Code, Sections 6735, 7835, and 7835.1 or federal officers and employees who are exempt from these Sections by California Business and Professions Code, Section 6739 or 7836. To demonstrate compliance with Title 16 CCR, Sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

10. The Discharger shall file a Report of Waste Discharge with the Central Valley Water Board at least 140 days before making any material change in the character, location, or volume of the discharge. A material change includes, but is not limited to, the following:
 - a. The addition of a new wastewater that results in a change in the character of the waste;
 - b. Significantly changing the disposal or waste application method or location;
 - c. Significantly changing the method of treatment;
 - d. Increasing the discharge flow beyond that specified in the Order; and/or
 - e. Expanding existing herd size beyond 15 percent.

11. All reports shall be submitted to the following address:

For facilities in Fresno, Kern, Kings, Madera, Mariposa, and Tulare counties, submit reports to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706
Attention: Confined Animal Regulatory Unit

For facilities in Butte, Lassen, Modoc, Plumas, Tehama, and Shasta counties, submit reports to:

California Regional Water Quality Control Board
Central Valley Region
415 Knollcrest Drive, Suite 100
Redding, CA 96002
Attention: Confined Animal Regulatory Unit

For facilities in all other counties, submit reports to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670
Attention: Confined Animal Regulatory Unit

D. Requirements Specifically for Monitoring Programs and Monitoring Reports:

1. The Discharger shall file self-monitoring reports and/or technical reports in accordance with the detailed specifications contained in the MRP attached to the Order.
2. The Discharger shall maintain a written monitoring program sufficient to assure compliance with the terms of the Order. Anyone performing monitoring on behalf of the Discharger shall be familiar with the written program.
3. The monitoring program shall include observation practices, sampling procedures, and analytical methods designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points.
4. All instruments and devices used by the Discharger for the monitoring program shall be properly maintained and shall be calibrated as recommended by the manufacturer and at least once annually to ensure their continued accuracy.
5. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by the Order, and records of all data used to complete the reports. Records shall be maintained for a minimum of five years from the date of sample, measurement, report, or application. Records shall also be maintained after facility operations cease if wastes that pose a threat to water quality remain at the site. This five-year period may be extended during the course of any unresolved litigation regarding the discharge or when requested in writing by the Central Valley Water Board Executive Officer.
 - a. Records of on-site monitoring activities shall include the:
 - (1) Date that observations were recorded, measurements were made, or samples were collected;
 - (2) Name and signature of the individual(s) who made the observations, made and recorded the measurements, or conducted the sampling;
 - (3) Location of measurements or sample collection;

- (4) Procedures used for measurements or sample collection;
 - (5) Unique identifying number assigned to each sample; and
 - (6) Method of sample preservation utilized.
- b. Records of laboratory analyses shall include the:
- (1) Results for the analyses performed on the samples that were submitted;
 - (2) Chain-of-custody forms used for sample transport and submission;
 - (3) Form that records the date that samples were received by the laboratory and specifies the analytical tests requested;
 - (4) Name, address, and phone number of the laboratory which performed the analysis;
 - (5) Analytical methods used;
 - (6) Date(s) analyses were performed;
 - (7) Identity of individual(s) who performed the analyses or the lab manager; and
 - (8) Results for the quality control/quality assurance (QA/QC) program for the analyses performed.

E. Enforcement

1. California Water Code Section 13350 provides that any person who violates WDRs or a provision of the California Water Code is subject to civil liability of up to \$5,000 per day or \$15,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil liability of up to \$10 per gallon, or \$20 per gallon; or some combination thereof, depending on the violation, or upon the combination of violations. In addition, there are a number of other enforcement provisions that may apply to violation of the Order.

INFORMATION SHEET

Waste Discharge Requirements General Order No. R5-2007-0035 Existing Milk Cow Dairies

INTRODUCTION

This Information Sheet provides background information relative to General Order No. R5-2007-0035 and discusses the various requirements of the General Order.

This General Order implements the State laws and regulations relevant to confined animal facilities. This General Order will serve as general Waste Discharge Requirements (WDRs) for discharges of waste from existing milk cow dairies and is intended to be compatible with the United States Environmental Protection Agency's regulations for concentrated animal feeding operations (CAFOs). This General Order is not a National Pollutant Discharge Elimination System (NPDES) Permit and does not authorize discharges of pollutants to surface water that are subject to NPDES permit requirements of the Clean Water Act. This Information Sheet is a part of the General Order.

All dairies covered under this General Order are required to:

- Comply with all provisions of the General Order
- Submit a Waste Management Plan for the production area
- Develop and implement a Nutrient Management Plan (NMP) for all land application areas
- Monitor wastewater, soil, crops, manure, surface water discharges, and storm water discharges
- Monitor surface water and groundwater
- Keep records for the production and land application areas
- Submit annual monitoring reports

CENTRAL VALLEY WATER BOARD AUTHORITY TO ISSUE WASTE DISCHARGE REQUIREMENT ORDERS

The Central Valley Water Board authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater, and the prevention of nuisance, is found in the Porter-Cologne Water Quality Control Act (California Water Code Division 7). Regulation is accomplished through issuance of WDRs or the waiver of such requirements. All confined animal facilities are subject to this regulatory authority.

Confined animal facilities are defined in Title 27 California Code of Regulations (CCR) Section 20164 as "... any place where cattle, calves, sheep, swine, horses, mules, goats, fowl, or other domestic animals are corralled, penned, tethered, or otherwise

enclosed or held and where feeding is by means other than grazing.” Designation as a confined animal facility under these state regulations is not based on facility size.

California Water Code Section 13263(i) authorizes the issuance of general orders to regulate discharges of waste that meet specified criteria. The criteria in the California Water Code includes the following:

- The discharges are produced by the same or similar types of operations
- The discharges involve the same or similar types of wastes
- The discharges require the same or similar treatment standards
- The discharges are more appropriately regulated under general WDRs rather than individual WDRs

A general order for existing dairy facilities is appropriate because they: (a) involve the same or substantially similar types of operations, where animals are confined and wastes are managed by onsite storage, land application, or removal offsite; (b) discharge the same type of waste, primarily animal waste; (c) are subject to State regulations that impose the same or similar treatment standards; (d) have the same potential to impact surface water and groundwater; and (e) given the large number of facilities and their similarities, existing dairies are more appropriately regulated under general WDRs rather than individual WDRs.

DAIRY FACILITIES IN THE CENTRAL VALLEY REGION AFFECTED BY THIS GENERAL ORDER

There are approximately 1,600 milk cow dairy operations within the Central Valley Region (Region) that will be affected by this General Order. Consistent with California Water Code Section 13260, any person who owns and/or operates any confined animal facility in the Central Valley must file a Report of Waste Discharge (ROWD) with the appropriate Regional Water Quality Control Board (Regional Board). The requirement to submit a ROWD was waived for most dairies pursuant to Central Valley Water Board Resolution No. 82-036. Pursuant to California Water Code Section 13269 (as amended by Senate Bill (SB) 390), that waiver expired on 1 January 2003 unless the Central Valley Water Board renewed it.

To replace the expiring waiver for confined animal facilities, the Central Valley Water Board adopted Resolution R5-2002-0205 on 6 December 2002. This Resolution required all dairies to file a ROWD and each facility would be regulated in one of three ways: 1) an individual or general waste discharge requirement (under State law), 2) a conditional waiver of waste discharge requirements (Waiver) (under State law), or 3) an individual or general National Pollutant Discharge Elimination System (NPDES) permit (under Federal law). The rules for obtaining a Waiver were included as part of Resolution R5-2002-0205.

The Central Valley Water Board rescinded Resolution R5-2002-0205 on 13 March 2003 because neither general waste discharge requirements nor a general NPDES permit were available as options for facility operators to consider before the Resolution R5-2002-0205 deadlines to apply for a Waiver.

The waiver rescission however left all dairy operators without a clear understanding of their responsibility to comply with Water Code section 13260, which describes the need to file a ROWD for coverage under a Waste Discharge Requirement. To clarify the issue, on 27 May 2003, Central Valley Water Board staff wrote to all dairies that were in operation as of the date of that letter and staff stated in the letter "*owners and/or operators of existing dairies are not expected to submit any information to the Regional Board until requested to do so.*" On 8 August 2005, Central Valley Water Board staff notified (by certified mail) the owners and/or operators of known existing dairy facilities that they were required to file a Report of Waste Discharge for their existing dairy facility by 17 October 2005 (hereafter referred to as "ROWD Request Letter").

This General Order only applies to owners and operators of existing milk cow dairies (Dischargers) in the Central Valley Region. For the purposes of this General Order, existing milk cow dairies are those that were operating as of 17 October 2005 and filed a ROWD in response to the 8 August 2005 ROWD Request Letter.

Existing dairy operations include herd sizes that may vary in order to ensure a constant milk production volume. Maintaining constant milk production requires a dairy operator to manage the herd, continually producing calves, raising support stock to replace cows that die or fail to produce, and selling some of the mature cows and support stock. Professionals at the University of California Davis estimate the normal variation in California dairy herd sizes ranges from about 10 to 15 percent.

For the purposes of this Order, existing herd size is defined as the maximum number of mature dairy cows reported in the Report of Waste Discharge submitted in response to the 8 August 2005 ROWD Request Letter, plus or minus 15 percent of that reported number to account for the normal variation in herd sizes.

For the purposes of this Order, an increase in the number of mature dairy cows of more than 15 percent beyond the number reported in the Report of Waste Discharge submitted in response to the 8 August 2005 ROWD Request Letter is considered an expansion.

Forty-two (42) existing milk cow dairies in the Region are currently regulated under General WDRs for Milk Cow Dairies, Order No. 96-270. Forty-four (44) additional existing milk cow dairies in the Region are currently regulated under individual WDRs. All of these existing facilities will be placed under this General Order.

On 17 April 1997, the State Water Resources Control Board (State Water Board) adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. Order No. 97-03-DWQ implements the final federal regulations (Title 40 Code of Federal Regulations Parts 122, 123, and 124) for storm water runoff published on 16 November 1990, by US EPA in compliance with Section 402(p) of the federal Clean Water Act. Approximately 250 dairy facilities in the Region are currently subject to Order No. 97-03-DWQ.

The Central Valley Water Board may also determine that some individual facilities are not appropriately regulated under a general order and may require owners and operators of such facilities to be regulated under individual WDRs.

DAIRY WASTES

For the purposes of this General Order, dairy waste includes, but is not limited to, manure, leachate, process wastewater and any water, precipitation or rainfall runoff that came into contact with raw materials, products, or byproducts such as manure, compost piles, feed, silage, milk, or bedding.

Waste generated at dairies is stored dry in piles or in liquid form in waste retention ponds. The wastes are then applied to cropland or transported off-site for utilization on cropland as a nutrient source. These nutrient-laden materials are applied to soils of varying character and drainage characteristics, varying proximity to surface drainages and waterways, different character of geology and depth to groundwater. Because of the site variability, this General Order requires the development of a Nutrient Management Plan that is field specific to ensure that optimum nutrient utilization takes place. Although the waste materials provide nutrients to crops, they can create nuisance conditions if improperly managed or cause pollution of surface water and/or groundwater if site conditions are not taken into account in preparing a nutrient utilization and management strategy. This General Order regulates the management of dairy wastes onsite and requires monitoring and continuous tracking of materials being taken off-site for utilization.

Dairy operators typically use chemicals such as cleaning products to disinfect their milking equipment, footbaths to maintain the health of their herd, and pesticides in both the production area and land application area. Some portion of some of these chemicals may be commingled with process wastewater before it is stored in the retention pond. This General Order requires Dischargers to identify the chemicals that are stored in the waste storage system or that could be discharged to surface water or ground water and the approximate amounts used annually at their dairy.

Manure from dairies contains high concentrations of salts (total dissolved solids, including constituents such as sodium and chloride) derived primarily from the feed and water sources used in the dairy production activities. Some dairies also use water softening devices for milk barn cleaning and other activities and the concentrated brines

or reject water is usually sent to the retention pond, thus increasing the salt concentrations further.

Manure from dairies contains nutrients (including nitrogen, ammonia, phosphorus and potassium compounds) that can be used in crop production. A recent review of dairy manure by a University of California Committee of Experts (UCCE) indicates that dairy cows in the Central Valley Region excrete approximately one (1) pound (lb) of nitrogen per head per day and approximately 1.29 lbs of inorganic salts (including only Na^+ , K^+ , and Cl^-) per head per day. Thus, a 1,000-cow dairy generates approximately 365,000 lbs of nitrogen and 470,000 lbs of inorganic salts (Na^+ , K^+ , and Cl^-) per year that must be managed to prevent impacts to water quality.

The application of dairy waste to cropland as a source of nitrogen provides some challenges due to the complexity of nitrogen in the crop-soil system. Nitrogen in the soil-crop system occurs in three different forms - organic nitrogen, ammonium, and nitrate. Organic nitrogen is strongly sorbed to soil particles and is not available for plant uptake. Ammonium nitrogen is plant available, but also sorbs to soil particles. Ammonium nitrogen is converted to nitrate within days to weeks under most California conditions. Nitrate is plant available, does not adsorb to soil particles, and moves readily with soil water.

The source of organic nitrogen in soil is crop residue, the soil organic matter pool, and dairy waste applications. Organic nitrogen will mineralize to ammonium over time with the rate of mineralization dependent upon microbial processes that are dependent upon temperature, moisture, and other conditions. The UCCE review of dairy waste reported that a study of organic nitrogen mineralization in California showed that mineralization of organic nitrogen is essentially complete within one to seven years. Thus, organic nitrogen provides a steady, relatively slow release of plant available and leachable nitrogen. Applying manure with high organic nitrogen content may not meet a crop's nitrogen need during the most rapid growth stage, while exceeding the crop nitrogen uptake during the remainder of the crop's growing season, when the nitrogen may be subject to leaching.

The application of manure or process wastewater to a land application area results in the discharge of salts and nitrogen compounds. Oxidation of nitrogen compounds (i.e., ammonia and organic nitrogen compounds) to nitrites and nitrates has the potential to degrade the quality of surface water and groundwater in the Region, if not properly managed. Runoff from, or over-application on, these land application areas poses a threat to surface water quality. A similar threat to groundwater exists if the wastes are applied to the land application area at rates that exceed crop needs. The recent UCCC review of dairy waste states that based on field experiments and computer models, the appropriate nitrogen loading rate that minimizes nitrogen leaching and maximizes nitrogen harvest is between 140 to 165% of the nitrogen harvested. This is a slightly higher loading rate than what is allowed under New Mexico regulations which require

“...the total nitrogen in effluent that is applied to a crop that is harvested shall not exceed by more than 25 percent the maximum amount of nitrogen reasonably expected to be taken up by the crop...” (20.6.2.3109 NMAC). New Mexico does not allow adjustment of the nitrogen content to account for volatilization or mineralization processes.

Surface water can also be degraded and polluted by both the type and high concentrations of pollutants in dairy cow manure and manure wastewater. Ammonia in the waste is highly toxic to aquatic life and can suppress dissolved oxygen concentrations. In addition, nitrogen and phosphorus compounds in the waste can cause excessive algal growth in surface waters, resulting in lower oxygen levels and which in turn causes fish and other organisms to die. The presence of pathogens in the waste can create a public health threat through human contact with affected waters.

The Central Valley Water Board has documented many discharges of waste from existing milk cow dairies to surface water. Since 2004, approximately 70 Dischargers have received Notices of Violation from the Central Valley Water Board for such discharges. The Notices of Violation require immediate cleanup of the discharge and either remediation of the cause of the discharge or a plan with an implementation schedule for such remediation. Information regarding off-property discharges that result in a Notice of Violation is provided to the Northern Dairy Task Force per their standing request. The Northern Dairy Task Force reviews the information to determine if they should pursue additional legal action against the Discharger. Typical legal action by the Northern Dairy Task Force includes an offer of a settlement agreement. If an agreement cannot be reached, the Northern Dairy Task Force proceeds with civil action through the court system.

This General Order includes prohibitions, specifications, and provisions for the production and land application areas that are consistent with the state regulations. Consistent with Title 27, this General Order prohibits the direct or indirect discharge of waste from the production area to surface water. This General Order also prohibits discharges of: (1) wastewater to surface waters from cropland, and (2) waste to surface waters that causes pollution or nuisance, or that causes or contributes to an exceedance of any water quality objective in the Basin Plans or water quality criteria set forth in the California Toxics Rule and the National Toxics Rule. This General Order includes groundwater limitations, which specify “Discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.” This General Order also requires monitoring of: (1) any discharges to surface water, including surface water upstream and downstream of the discharge (but not during tailwater discharges to surface water), and discharges of tailwater to surface water to ensure that no unforeseen impacts are occurring, and (2) groundwater.

Storm water may contain pollutants from dairy wastes if the storm water is allowed to contact manured areas or commingle with wastewater from the dairy. This General Order prohibits discharges of storm water from the production area to surface water and any discharge of storm water to surface water from the land application areas being used for nutrient utilization unless that discharge is from land that has been managed consistent with a certified Nutrient Management Plan.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Title 27 California Code of Regulations (CCR)

Division 2, Subdivision 1, Chapter 7, Subchapter 2, Article 1 of Title 27 of the California Code of Regulations (Title 27) prescribes minimum standards for discharges of animal waste at confined animal facilities to protect both surface water and groundwater. For surface water protection, Title 27 includes requirements for adequate design of containment facilities for both storm water and process wastewater and for adequate flood protection.

For groundwater protection, the minimum standards in Title 27 requires existing milk cow dairies to: minimize percolation of wastewater to groundwater in disposal fields; apply manure and wastewater to disposal fields at reasonable agronomic rates; minimize infiltration of water into underlying soils in manured areas; and locate retention ponds in, or line retention ponds with, soils of at least 10% clay and no more than 10% gravel.

The Central Valley Water Board has received documentation of impacts to groundwater quality that indicates the Title 27 minimum standards may not be sufficient to adequately protect groundwater quality at all confined animal facilities in the Region. Adverse impacts to groundwater due to discharges from existing milk cow dairies have been detected in areas where groundwater is as deep as 120 feet below ground surface and in areas underlain by fine-grained sediments.

Most of the existing milk cow dairies covered under the General Order have been operating for many years and it is expected that groundwater quality may already be impacted at many of these dairies due to the past operations, including those dairies in compliance with the Title 27 regulations. For example, groundwater samples collected from 425 water supply wells (domestic and agricultural – stock watering and irrigation) on 88 dairies in Tulare County between August 2000 and June 2006 showed that approximately 39% of the wells sampled had nitrate concentrations greater than the maximum contaminant level for drinking water. At least one nitrate polluted well was found at approximately 63% of these dairies.

This General Order requires Dischargers to monitor groundwater to ensure that groundwater protection is being achieved. Groundwater monitoring at existing dairies is necessary to: determine background groundwater quality; determine existing groundwater conditions near retention ponds, corrals, and land application areas; and

determine the effect of the improved management practices required in the General Order on groundwater quality.

It is impractical to require all existing dairies to install monitoring wells within a short time period due to the limited number of professionals available to design and install groundwater monitoring systems and the limited staff to review Monitoring Well Installation and Sampling Plans. To determine the existing groundwater conditions at each dairy within the shortest time period requires establishment of priorities. This General Order requires each Discharger to immediately begin sampling of each domestic and agricultural well present at the dairy and discharges from any subsurface (tile) drains. The Executive Officer will issue monitoring and reporting program orders to install monitoring wells based on an evaluation of the threat to water quality at each site. It is anticipated that this will occur in phases of approximately 100 to 200 dairies per year.

The first phase of dairies ordered to install groundwater monitoring wells will be those dairies where nitrate-nitrogen is detected at 10 mg/l or more in any one domestic well, agricultural well, or subsurface (tile) drainage system in the vicinity of the dairy. The monitoring and reporting program will determine existing groundwater conditions first in areas with suspected groundwater impacts. If necessary, the Executive Officer will further prioritize these groundwater monitoring requirements based on factors such as: proximity to a municipal or domestic supply well, artificial recharge area, or Department of Pesticide Regulation Groundwater Protection Area; nitrate concentrations in neighboring domestic wells; number of crops grown per year; whether or not the NMP is completed by **1 July 2009**; and any other pertinent site-specific conditions. Pursuant to Section 13267 of the California Water Code, the Executive Officer may order implementation of a monitoring and reporting program at a dairy at any time. Such order may occur, for instance, if violations of the General Order are documented and/or the dairy is found to be in an area where site conditions and characteristics pose a high risk to groundwater quality.

A summary of how the Executive Officer will determine priorities for installation of monitoring wells is provided in Table 5 of Attachment A to Monitoring And Reporting Program No. R5-2007-0035. This table may be revised as needed by the Executive Officer to ensure proper prioritization is being implemented.

In the future, the Executive Officer or Central Valley Water Board may determine that a proposed alternative method of environmental monitoring is appropriate to determine if groundwater protection is being achieved. One suggested alternative has been to allow regional groundwater monitoring as a substitute for groundwater monitoring at individual dairies. Any proposed alternative will require sufficient details for consideration by either the Executive Officer or Central Valley Water Board. The Executive Officer or the Central Valley Water Board must issue a monitoring and reporting program order for any alternative environmental monitoring.

California Environmental Quality Act (CEQA)

The Central Valley Water Board adopted a Negative Declaration in accordance with CEQA in 1982 with the adoption of Central Valley Water Board Resolution 82-036, which waived waste discharge requirements for confined animal facilities where the Discharger complies with Central Valley Water Board guidelines. That waiver program expired on 1 January 2003.

The Central Valley Water Board's preliminary review of this General Order determined that the adoption of this General Order is exempt from the requirements of CEQA based on three categorical exemptions allowed in Title 14 California Code of Regulations (CCR). These categorical exemptions are discussed below.

- CEQA Guidelines Exemption 1 for Existing Facilities (Title 14 CCR Section 15301) that applies to “...*the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination...*”
- CEQA Guidelines Exemption 2 for Replacement of Existing Structures (Title 14 CCR Section 15302) that applies to the “...*replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced...*”
- CEQA Guidelines Exemption 4 for Minor Alterations (Title 14 CCR Section 15304) that applies to “*minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes...*”

The adoption of this Order is categorically exempt from CEQA because:

- Consistent with the “existing facility” exemption in Title 14 CCR Section 15301, eligibility under this Order is limited to milk cow dairies that were existing facilities as of 17 October 2005. This Order does not authorize expansion of use beyond that existing as of 17 October 2005. Restoration of, or improvements to dairy waste management systems to ensure proper function in compliance with this Order will involve minor alterations of existing private facilities.
- Consistent with the categorical exemption of Title 14 CCR Section 15302, this Order will require covered dairies to replace or reconstruct waste management systems to ensure proper function in compliance with this Order.
- Consistent with the categorical exemption of Title 14 CCR Section 15304, this Order will require covered dairies to make improvements to their waste

management systems that will result in minor alterations to land, water, and/or vegetation.

Compliance with this General Order will reduce or avoid impacts to surface water and groundwater from existing milk cow dairies. The majority of the approximately 1,600 existing milk cow dairies potentially covered under this General Order operated under a waiver program that was in effect from 1982 to December 2002. Approximately 86 of these existing facilities are currently operating under either an individual WDR Order or a 1996 General WDR Order. The majority of existing milk cow dairies will be covered under this General Order, which imposes significantly more stringent requirements compared to the previous WDRs or the waiver of WDRs.

This General Order will reduce impacts to surface water and groundwater at existing milk cow dairies by requiring Dischargers to demonstrate compliance with State Water Board Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality Waters in California*), Title 27 CCR for confined animal facilities, and the Basin Plans. This General Order reduces impacts to surface water by prohibiting discharges of: (1) waste and/or storm water to surface water from the production area, (2) wastewater to surface waters from cropland, and (3) storm water to surface water from the land application area where manure or process wastewater has been applied, unless the land application has been managed consistent with a certified Nutrient Management Plan. This General Order also prohibits discharges that cause or contribute to exceedances of any water quality standards.

This General Order reduces impacts to groundwater by requiring Dischargers to: (1) develop and implement Nutrient Management Plans that will control nutrient losses from land application areas; (2) provide an engineering evaluation of an existing pond and propose and implement approved remedial measures when groundwater monitoring demonstrates that an existing pond has adversely impacted groundwater quality; (3) design and construct new ponds and reconstructed existing ponds to comply with the groundwater limitations of the General Order; (4) document that no cross connections exist that would allow the backflow of wastewater into a water supply well or irrigation well; and (5) submit an Operation and Maintenance Plan to ensure that (a) procedures have been established for solids removal from retention ponds to prevent pond liner damage and (b) corrals and/or pens, animal housing areas, and manure and feed storage areas are maintained to collect and divert process wastewater and runoff to the retention pond and minimize infiltration of wastewater and leachate from these areas to the underlying soils. This General Order also reduces impacts to groundwater by requiring that discharges of waste from existing milk cow dairies shall not cause groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses of the groundwater, or cause a condition of pollution or nuisance.

This General Order requires monitoring of discharges, surface water, groundwater, storm water, and tailwater to determine compliance with this General Order.

Water Quality Control Plans

The Central Valley Water Board has adopted Water Quality Control Plans (Basin Plans) for the Sacramento River and San Joaquin River Basins (4th ed.) and for the Tulare Lake Basin (2nd ed.). These two Basin Plans designate the beneficial uses of groundwater and surface waters of the Region, specify water quality objectives to protect those uses, and include implementation programs for achieving water quality objectives. The Basin Plans also include plans and policies of the State Water Board incorporated by reference, including State Water Board Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality Waters in California*), State Water Board Resolution 88-63 (*Sources of Drinking Water Policy*), and State Water Board Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup or Abatement of Discharges Under Water Code Section 13304*). This General Order specifies requirements necessary to comply with the Basin Plans, including requirements to meet the water quality objectives and protect beneficial uses specified in the Basin Plans, and other applicable plans and policies.

Beneficial Uses of Surface Water and Groundwater

Pursuant to Chapter II of the Basin Plans, the beneficial uses of surface water may include: municipal and domestic supply; agricultural supply; agricultural stock watering; industrial process supply; industrial service supply; hydro-power generation; body contact water recreation; canoeing and rafting; other non-body contact water recreation; warm freshwater aquatic habitat; cold freshwater aquatic habitat; warm fish migration habitat; cold fish migration habitat; warm spawning habitat; cold spawning habitat; wildlife habitat; navigation; rare, threatened, and endangered species; groundwater recharge; freshwater replenishment; aquaculture; and preservation of biological habitats of special significance. Both Basin Plans contain a Table that lists the surface water bodies and the beneficial uses and where not listed, the Basin Plans designate beneficial uses based on the waters to which they are tributary or applicable state or federal requirements. These beneficial uses are protected in this General Order by, among other requirements, the prohibition of a direct or indirect discharge of waste and/or storm water from the production area to surface waters, the prohibition of discharge of wastewater to surface waters from cropland, the prohibition of any discharge of storm water to surface water from the land application areas unless the land application area has been managed consistent with a certified Nutrient Management Plan, and the prohibition of discharge of waste from existing milk cow dairies to surface waters which causes or contributes to an exceedance of any applicable water quality objective in the Basin Plans or any applicable state or federal water quality criteria, or a violation of any applicable state or federal policies or regulations.

Chapter II of the Sacramento River and San Joaquin River Basin Plan states: “*Unless otherwise designated by the Regional Water Board, all groundwaters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process*

supply.” Chapter II of the Tulare Lake Basin Plan designates the beneficial uses of groundwater to include municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, water contact recreation, and wildlife habitat. The Tulare Lake Basin Plan includes a Table that lists the designated beneficial uses of groundwater within the Basin. These beneficial uses are protected in this Order by, among other requirements, the specification that the discharge of waste at an existing milk cow dairy shall not cause a violation of water quality objectives, cause pollution or nuisance, or degrade the groundwater.

Water Quality Objectives

Pursuant to the California Water Code Section 13263(a), WDRs must implement the Basin Plans, which require consideration of the beneficial uses of water, water quality objectives reasonably required to protect the beneficial uses, other waste discharges, the need to prevent nuisance conditions in the disposal area, and the receiving water. The water quality objectives are implemented in WDRs consistent with the Basin Plans’ *Policy for Application of Water Quality Objectives*. The Basin Plans require that WDRs apply the most stringent objective for each constituent to ensure that discharges do not cause adverse affects to any beneficial use.

Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. Water quality objectives apply to all waters within a surface water or groundwater resource for which beneficial uses have been designated. Water quality objectives are listed separately for surface water and groundwater in Chapter III of the Basin Plans and are either numeric or narrative.

The primary waste constituents of concern due to discharges of waste from dairies are ammonia, nitrates, phosphorus, chloride, boron, salts, pathogens, and organic matter. The discharge of waste from dairies must not cause surface water or groundwater to exceed the applicable water quality objectives for those constituents.

Water Quality Objectives and Federal Criteria for Surface Water¹

Water quality objectives that apply to surface water include, but are not limited to, (1) the numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Title 22 CCR Division 4, Chapter 15 Sections 64431 and 64444 that are applicable through the Basin Plans to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, and the

¹ It is important to note that this General Order prohibits the direct or indirect discharge of waste and/or storm water from the production area to surface waters, the discharge of wastewater to surface waters from cropland, and the discharge of storm water to surface water from the land application areas where manure or process wastewater has been applied unless the land application area has been managed consistent with a certified Nutrient Management Plan.

salinity objectives; and (2) the narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, and the toxicity objective. The Basin Plans also contain numeric water quality objectives that apply to specifically identified water bodies, including for example, electrical conductivity objectives for the Delta.

Federal water quality criteria that apply to surface water are contained in federal regulations referred to as the California Toxics Rule and the National Toxics Rule. See 40 CFR Sections 131.36 and 131.38.

Water Quality Objectives for Groundwater

Water quality objectives that apply to groundwater include, but are not limited to, (1) numeric objectives, including the bacteria objective and the chemical constituents objective (includes state MCLs promulgated in Title 22 CCR Division 4, Chapter 15 Section 64431 and 64444 and are applicable through the Basin Plans to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives. The Tulare Lake Basin Plan also includes numeric salinity limits for groundwater.

Implementation of Water Quality Objectives

The Basin Plans include an implementation program for water quality objectives called the *Policy for Application of Water Quality Objectives*, which applies to implementation of both numeric and narrative water quality objectives. To evaluate compliance with narrative objectives, the Policy requires the Regional Board to consider, on a case-by-case basis, various factors and information, including direct evidence of beneficial use impacts (e.g., a fish kill), information submitted by the discharger and other interested parties (e.g., levels that constitute natural background or site-specific conditions, such as soil types), and “*relevant numerical criteria and guidelines developed and/or published by other agencies and organizations*”, such as the State Water Resources Control Board, California Department of Health Services, Department of Fish and Game, and the United States Environmental Protection Agency (USEPA). The Policy requires the Regional Board to consider this information and determine what specific numerical limit is “relevant and appropriate” to the situation at hand, and, therefore should be used in determining compliance with the narrative objective.

Narrative Water Quality Objectives

Some of the considerations of relevant numerical criteria and guidelines developed or published by other agencies and organizations include:

Agriculture

The Basin Plans contain a narrative chemical constituents objective for both groundwater and surface water that states that “[waters] shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” This objective applies to the protection of agricultural beneficial uses. Relevant numerical criteria and

guidelines for agricultural uses of groundwater are included in publications from the National Academy of Sciences, the University of California Cooperative Extension, and the Food and Agricultural Organization of the United Nations. This information is summarized in a 1985 publication *Water Quality for Agriculture, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29*, (hereafter U.N. Guidelines) and includes detailed information to evaluate the quality of irrigation water necessary to sustain various crops.

The major constituents used to assess the quality of water for beneficial uses of irrigated agriculture are salinity (expressed as total dissolved solids, or TDS), boron, chloride, and sodium. Salinity reduces crop growth by reducing the ability of plant roots to absorb water. Boron is an essential element in very low concentrations but can become toxic to plants when concentrations in water even slightly exceed the amount required for optimal growth. While boron sensitivity appears to affect a wide variety of crops, sodium and chloride toxicities are mostly limited to tree crops and woody perennials (e.g., citrus, stone-fruit, and vineyard). A predominance of sodium relative to other ions in irrigation water may also disperse soil aggregates, which in turn, affects virtually all crops by decreasing the permeability of the soil to water and air.

Nitrogen in the form of nitrate and ammonium can also affect some nitrogen sensitive crops such as sugar beets, grapes, apricots, citrus, avocado, and some grain crops. Production of nitrogen sensitive crops may be affected at nitrogen concentrations above 5 mg/L nitrate (as nitrogen) or ammonium-nitrogen.

The U.N. Guidelines conclude that salt tolerance of crops and yield reductions can vary depending on various factors, such as irrigation management, the crop being grown, and the site conditions. The U.N. Guidelines recommend that a site-specific assessment be conducted to determine if water quality above or below the U.N. Guidelines would provide protection of irrigated agricultural uses. The U.N. Guidelines divide water quality characteristics as having “No Problem – Increasing Problems – Severe Problems” and show numerical criteria that protect a full range of crops and would likely be protective under all irrigated agricultural uses. The numerical criteria for agricultural irrigation use are:

<u>Problem and Related Constituent</u>	<u>No Problem</u>	<u>Increasing Problems</u>
Salinity of irrigation water (micromhos per centimeter (µmhos/cm))	< 700	700 – 3,000
Salinity of irrigation water (total dissolved solids (mg/L))	< 450	450 – 2,000
Specific Ion Toxicity		
From ROOT absorption		
Sodium (mg/L)	< 69	69 – 207
Chloride (mg/L)	< 142	142 – 355
Boron (mg/L)	< 0.7	0.7 – 3.0
From FOLIAR absorption		
Sodium (mg/L)	< 69	> 69
Chloride (mg/L)	< 106	> 106
Miscellaneous		
NH ₄ -N (mg/L) (for sensitive crops)	< 5	5 – 30
NO ₃ -N (mg/L) (for sensitive crops)	< 5	5 – 30
HCO ₃ (mg/L) (only with overhead sprinklers)	< 90	90 – 520
pH	normal range =	6.5 – 8.4

In determining the concentrations of the constituents listed above that will not result in adverse affects on agricultural beneficial uses in a given area, multiple criteria can apply. While the most stringent concentration becomes the constraining criterion, it is not necessarily the concentration that is required to protect all crops typically grown in the area. The U.N. Guidelines reflect the highest tolerable level of quality necessary to sustain the most sensitive crops but those crops may or may not be grown in the area. An evaluation of the existing crops grown in an area and crops that could be grown in that area is necessary to determine what the most stringent water quality criteria are that will protect all beneficial uses of water in that area. The highest water quality that is reasonable must be maintained.

Animal Drinking Water

As shown in the U.N. Guidelines, water quality needed to protect dairy animal drinking water uses are less sensitive than irrigated agriculture for all constituents shown above.

Municipal and Domestic Supply

With respect to water quality needed to protect municipal and domestic supply, the Basin Plans contain the narrative taste or odor objective that state in summary that waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affects any beneficial use, or impart undesirable tastes or odors in fish flesh or other edible products. Waste from a dairy contains organic nitrogen, a decomposition by-product of which is ammonia, a taste-producing substance that, if present in excessive concentrations, can adversely affect the beneficial use of groundwater for municipal and domestic supply. J.E. Amooore and E. Hautala have

determined an odor threshold for ammonia-nitrogen of 1.5 mg/L (*Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, Journal of Applied Toxicology, Vol. 3, No. 6 (1983)). While this numeric level is a value that is to be met at the point of use (i.e., the tap, rather than the receiving water), the Basin Plans state that “[w]ater quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption.” In accordance with the *Policy on Application of Water Quality Objectives*, it is relevant, appropriate, and reasonable to use this numeric level of 1.5 mg/L ammonia-nitrogen to protect beneficial use of area groundwaters and surface waters for human consumption.

Aquatic Life

Ammonia is known to cause toxicity to aquatic organisms in surface waters. Waste from a dairy contains both ammonia and un-ionized ammonia, both of which can cause impact to aquatic life. The US EPA has established Ambient Water Quality Criteria for Ammonia for the protection of freshwater aquatic life. These criteria include an acute criterion (1-hour average) for total ammonia (including ionized and un-ionized ammonia) that is dependent on pH and fish species and a chronic criterion (30-day average) that is dependent on pH and temperature, and at temperatures less than 15 degrees centigrade (59° F) is also dependent on fish species. For freshwater aquatic life protection, the acute criterion for total ammonia-nitrogen ranges from 0.885 (at pH 9.0) to 32.6 (at pH 6.5) milligrams nitrogen per liter (mg N/L) when salmonids are present and from 1.32 (at pH 9.0) to 48.4 (at pH 6.5) mg N/L when salmonids are absent. The chronic criterion for total ammonia-nitrogen ranges from 0.179 (at pH 9.0) to 10.8 (at pH 6.5). These criteria are based on total (un-ionized plus ionized) ammonia.

The California Department of Fish and Game criteria to protect freshwater aquatic life is 0.02 mg/L un-ionized ammonia. The equilibrium between un-ionized and ionized ammonia is controlled by temperature and pH. The California Department of Fish and Game determines the concentration of un-ionized ammonia based on the known percentage of un-ionized ammonia in a concentration of total ammonia at a given temperature and pH.

Numeric Water Quality Objectives

Maximum Contaminant Levels (Drinking Water Standards)

The Basin Plan’s incorporation of MCLs by reference is prospective to incorporate changes to MCLs as changes in Title 22 CCR take effect. Should a change occur to an MCL and that MCL thereby becomes the most or more stringent objective, implementation of the changed objective would be effected through reopening of this General Order and consideration of a time schedule if compliance cannot be achieved immediately.

Water Quality Objectives for Bacteria

The majority of waste collected at a dairy is fecal matter or manure. This waste contains pathogenic bacteria and can impact water quality if not properly handled. The Basin Plans contain numeric water quality objectives for bacteria in surface waters and in groundwater. For surface water, the Basin Plans specify that “[i]n waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.” For groundwater, the Basin Plans specify that “[i]n ground waters used for domestic or municipal supply the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml.”

Receiving Water Limitations for Dairies

The numeric water quality objectives and numeric limits that are relevant and appropriate to implement narrative water quality objectives applicable to the primary waste constituents of concern in discharges of waste at dairy facilities that could affect groundwater and surface water are as follows: For groundwater, the most stringent limitations to implement narrative and numeric water quality objectives are for total coliform 2.2/100 milliliter (ml), for ammonia-nitrogen 1.5 mg/L, for boron 0.7 mg/L, for chloride 106 mg/L, for nitrate-nitrogen 5 mg/L, for EC 700 μ mhos/cm, and for TDS 450 mg/L. For surface water, the most stringent limitations to implement narrative and numeric water quality objectives and criteria are for total coliform 2.2/100 ml, for chloride 106 mg/L, for nitrate-nitrogen 5 mg/L, for EC 700 μ mhos/cm, and for TDS 450 mg/L. For surface water, the appropriate limitation for ammonia is 0.02 mg/L un-ionized ammonia or a concentration of total ammonia determined by the pH and fish species, whichever is less. Less stringent limitations may apply to different areas but can only be determined through a site-specific assessment. Individual dischargers may propose the application of less stringent limitations for consideration in monitoring and reporting programs or through revision of this General Order. Dairy waste may include other waste constituents not mentioned here. This General Order requires the discharge to comply with all water quality objectives and federal water quality criteria for surface waters applicable to the discharge.

State Water Board Resolution 68-16

State Water Board Resolution 68-16 requires that any discharge of waste to waters must be regulated to achieve the highest water quality consistent with the maximum benefit of the people of the state. Further, it states that high quality water must be maintained unless it is demonstrated that any change in water quality will, among other things, not unreasonably affect present and anticipated beneficial uses or violate the Basin Plans. Further, it states that any activity that discharges waste must be required to meet waste discharge requirements which will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with the maximum benefit to the people of the state will be maintained. With respect to surface water, Resolution 68-16

must be implemented consistent with the federal “antidegradation” policy (Title 40 Code of Federal Regulations Section 131.12). This General Order is consistent with these policies because it: (1) prohibits the direct or indirect discharge of waste and/or storm water from the production area to surface waters; (2) prohibits the discharge of waste to surface waters that causes or contributes to exceedances of water quality objectives in the Basin Plan or any applicable state or federal water quality criteria; (3) prohibits the collection, treatment, storage, discharge or disposal of waste that results in contamination or pollution of surface water or groundwater or a condition of nuisance; and (4) contains groundwater limitations that, at a minimum, prohibit further degradation and adverse impacts to beneficial uses of groundwater or violations of water quality objectives specified in the Basin Plans.

To be consistent with State Water Resources Control Board Resolution 68-16, Dischargers must employ best practicable treatment or control measures to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained.

Best Practicable Treatment Or Control Measures For Retention Ponds

Title 27 CCR Division 2 requires that retention ponds be located in, or lined with, soils of at least 10% clay and no more than 10% gravel. An October 2003 report (Task 2 Report) by Brown, Vence, and Associates (BVA) concluded that the “...current Title 27 requirements are insufficient to prevent groundwater contamination from confined animal facilities, particularly in vulnerable geologic environments.” Three counties in the Region, many other states, and the Natural Resources Conservation Service have pond design requirements that are more stringent than is required by Title 27 (see Table 1 at the end of this Information Sheet).

Kings County and Merced County require pond liners to have a maximum seepage rate of 1×10^{-6} cm/sec. Four of the top ten milk producing states require ponds to be designed to comply with the state’s Natural Resources Conservation Service Practice Standard 313 (CPS 313). These states’ CPS 313s have pond liner requirements that range from in-place soils (two to three feet thick with more than 50 percent fines or maximum permeability of 1×10^{-6} centimeters per second (cm/sec)), or a liner of one foot thick compacted clay with maximum permeability of 1×10^{-7} or maximum seepage rate of 1×10^{-5} cm/sec, bentonite, a geomembrane, geosynthetic clay, or concrete.

One state (Idaho) requires pond liners to comply with NRCS Agricultural Waste Management Field Handbook Appendix 10D, which recommends either: two feet of in-place soils with maximum permeability of 1×10^{-6} cm/sec or a liner of compacted clay (minimum one foot thick with allowable seepage rate of 1×10^{-5} cm/sec if manure sealing credit allowed or 1×10^{-6} cm/sec if manure sealing credit not allowed), concrete, geomembrane, or geosynthetic clay. New Mexico and Texas require pond liners have a maximum permeability of 1×10^{-7} cm/sec and Minnesota requires pond liners with a maximum seepage rate of 5×10^{-7} cm/sec.

California CPS 313 requires pond liners have a maximum target seepage rate of 1×10^{-6} cm/sec, except where aquifer vulnerability or risk is high in which case a synthetic liner or other alternative liner is required (see Table 1 of this Information Sheet).

While these other pond design requirements provide more groundwater protection than the Title 27 requirements, there are no known studies that evaluate the ability of any of these county, state, or NRCS pond liner requirements to protect groundwater quality. It would be impossible to determine if any proposed pond design would be protective of groundwater quality without an evaluation of site-specific information on depth to groundwater, existing groundwater quality beneath the facility, nature of the geologic material between the bottom of the retention pond and the first encountered groundwater, nature of the leachate from the retention pond, and proximity to existing supply wells. Any proposed pond design that does not include such an evaluation should be the most conservative possible to assure protection of groundwater under any conditions.

The most conservative pond design would include a double lined pond with a leachate collection and removal system between two geosynthetic liners. Such pond designs are currently being approved by the Central Valley Water Board to contain landfill leachate.

Consistent with State Water Resources Control Board Resolution 68-16, this Order requires that new retention ponds or reconstructed existing ponds be designed and constructed to comply with the groundwater limitations in the Order. The Order provides a two-tiered approach that will allow the Discharger two options to retention pond design. This approach will significantly reduce the time required for approval by the Executive Officer. Tier 1 includes a retention pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with Section 20340 of Title 27) between the two liners. This design will be considered to be consistent with Resolution 68-16. Review for retention ponds designed to this standard will be conducted in less than 30 days of receipt of a complete design plan package submitted to the Board.

Tier 2 includes a retention pond designed in accordance with California Natural Resource Conservation Service (NRCS) Conservation Practice Standard 313 or equivalent and which the Discharger must demonstrate through submittal of technical reports that the alternative design is protective of groundwater quality.

Best Practicable Treatment or Control Measures for Land Application Areas

Pursuant to Title 40 Code of Federal Regulations Section 122.23(e), precipitation-related discharges from land application areas are considered agricultural storm water discharges and are not subject to the United States Environmental Protection Agency (USEPA) regulations for concentrated animal feeding operations (CAFOs) if the

“...manure, litter, or process wastewater has been applied in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater, as specified in Section 122.42(e)(1)(vi)-(ix)...”

The USEPA has established best practicable control technology currently available for application of waste from large concentrated animal feeding operations to land application areas. The best practicable control technology includes best management practices required by Title 40 Code of Federal Regulations Section 122.42(e)(1)(vi)-(ix).

The technical standards for nutrient management as specified in Attachment C of this Order are consistent with the USEPA best practicable control technology and the best management practices required by Title 40 Code of Federal Regulations Section 122.42(e)(1)(vi)-(ix) and the large CAFO best practicable control technology. Therefore, precipitation-related discharges from land application areas at facilities operating in compliance with this Order are agricultural storm water discharges. And since they are consistent with USEPA best practicable control technology, the technical standards for nutrient management represent best practicable treatment or control for the purposes of State Water Resources Control Board Resolution 68-16.

Normal commercial farming practices, including those involving dairy waste, contribute salts, nutrients, pesticides, trace elements, sediments and other by-products that can affect the quality of surface water and groundwater. Evaporation and crop transpiration remove water from soils, which can result in an accumulation of salts in the root zone of the soils at levels that retard or inhibit plant growth. Additional amounts of water often are applied to leach the salts below the root zones. The leached salts can reach groundwater or surface water. Even using the most efficient irrigation systems and appropriate fertilizer application rates and timing to correspond to crop needs, irrigation of cropland will have some measurable impact on existing high quality groundwater as a result of the leaching required to protect the crops from salt buildup in the root zone.

In land applications areas where groundwater is shallow, some Dischargers have installed subsurface (tile) drainage systems to maintain the groundwater level below the crop's root zone. Drainage from these systems may be discharged directly to surface water bodies or to drainage ditches that discharge to surface water bodies. Some of these systems discharge to evaporation basins that are subject to waste discharge requirements. Discharges from these systems have elevated concentrations of salts, including nitrates and other nutrients. This Order requires Dischargers who have these systems to identify their location and discharge point and to monitor discharges from these systems.

The majority of the Dischargers that will be covered under this Order have been operating for many years without a Nutrient Management Plan, which would have minimized the impacts of land applications of dairy waste to surface water and

groundwater quality. This Order requires each Discharger to develop and implement a Nutrient Management Plan, which should result in improved water quality by requiring appropriate management of dairy waste applied to the land application areas.

Consistent with State Water Resources Control Board Resolution 68-16, this Order requires that process wastewater that is applied to land application areas under the Discharger's control: (1) be managed according to a certified Nutrient Management Plan that is consistent with the technical standards specified in Attachment C, and (2) not cause groundwater to exceed the groundwater limitations of this Order.

State Water Board Resolution 88-63

State Water Board Resolution 88-63 specifies that all surface waters and groundwaters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply except where the groundwater meets one or more of the criteria specified in the Basin Plan, including:

- a. The TDS exceeds 3,000 milligrams per liter (mg/L) (5,000 micromhos per centimeter (umhos/cm) electrical conductivity) and the aquifer cannot reasonably be expected by the Regional Board to supply a public water system;
- b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; or
- c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Both Basin Plans include criteria for granting exceptions to municipal and domestic supply designation based on Resolution 88-63. The Tulare Lake Basin Plan also includes criteria for granting exceptions to the designation of beneficial uses for agricultural supply and industrial supply. De-designation of a beneficial use requires an amendment to the Basin Plan. The Tulare Lake Basin Plan specifies exceptions to the designated beneficial uses for some groundwater within the Tulare Lake Basin. Exceptions to Resolution 88-63 are not self-implementing, but must be established in an amendment to the Basin Plan.

State Water Board Resolution 92-49

State Water Board Resolution 92-49 contains policies and procedures for Regional Water Quality Control Boards (Regional Boards) to follow for the oversight and regulation of investigations and cleanup and abatement activities from all types of discharge or threat of discharge subject to Section 13304 of the California Water Code. It directs the Regional Boards to ensure that dischargers cleanup and abate the effect of discharges. This cleanup and abatement is to be done in a manner that promotes

attainment of background water quality, or the highest water quality that is reasonable if background levels of water quality cannot be restored. Any cleanup less stringent than background water quality shall be consistent with maximum benefit to the people of the state and not unreasonably affect present and anticipated beneficial uses of such water.

The Central Valley Water Board may order cleanup and/or abatement actions pursuant to California Water Code Section 13304 and State Water Board Resolution 92-49 where groundwater monitoring indicates discharges from a dairy have impacted groundwater quality.

Title 40 Code of Federal Regulations

Title 40 Code of Federal Regulations Section 122.21 (a)(1), as promulgated on 12 February 2003, requires that "All concentrated animal feeding operations have a duty to seek coverage under an NPDES permit..." The federal regulations allow an exception to this requirement. The exception applies if the permitting authority determines that a large concentrated animal feeding operation has no potential to discharge.

On 28 February 2005, the 2nd Circuit Court of Appeals, in a decision on an appeal to the federal regulations (*Waterkeeper Alliance, Inc. et al v. U.S. Environmental Protection Agency, ___F.3d___, Case No. 03-4470*), vacated the requirement for all CAFOs to either apply for an NPDES permit (whether or not they had an actual discharge) or demonstrate they have no potential to discharge. US EPA is currently revising the federal regulations to incorporate the 2nd Circuit Court's decision.

RECEIVING WATER LIMITATIONS

The appropriate receiving water limitations for a particular dairy covered under this General Order depend on the beneficial uses of the water as designated in the Basin Plan(s) and the water quality objectives necessary to protect all beneficial uses of the water. Specific receiving water limitations for dairies are discussed above under the heading **Water Quality Control Plans – Receiving Water Limitations for Dairies**.

This Order prohibits: the direct or indirect discharge of waste and/or storm water from the production area to surface waters; the discharge of waste from existing milk cow dairies to surface waters which causes or contributes to an exceedance of any applicable water quality objective in the Basin Plans or any applicable state or federal water quality criteria, or a violation of any applicable state or federal policies or regulations.

The groundwater limitations of this Order require that "Discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance." These limitations are consistent with the Basin Plan(s) and State Water Board Resolution 68-16.

LAND APPLICATION SPECIFICATIONS

This General Order includes land application specifications that require Dischargers to develop and implement a NMP that provides protection of both surface water and groundwater. The contents of the NMP and technical standards for nutrient management are specified in Attachment C to this General Order. The land application specifications also require Dischargers to have a written agreement with each third party that receives process wastewater from the Discharger for its own use. The written agreement will be effective until the third party is covered under waste discharge requirements or a waiver of waste discharge requirements that are adopted by the Central Valley Water Board and that are specific to the application of the Discharger's process wastewater to land under the third party's control.

The written agreement must identify the Discharger, the third party, the Assessor's Parcel Number and acreage of the cropland where the process wastewater will be applied, and the types of crops to be fertilized with the process wastewater. The written agreement must also include an agreement by the third party to: (1) use the process wastewater at agronomic rates appropriate for the crop(s) grown, and (2) prevent the runoff to surface waters of wastewater, storm water or irrigation supply water that has come into contact with manure or is blended with wastewater.

The technical standards for nutrient management require Dischargers to monitor soil, manure, process wastewater, irrigation water, and plant tissue as specified in Monitoring and Reporting Program No. R5-2007-0035. The results of this monitoring are to be used in the development and implementation of the NMP.

This General Order also requires Dischargers to create and maintain specific records to document implementation and management of the minimum elements of the NMP, records for the land application area, a copy of the Discharger's NMP, and records on manure, bedding, and process wastewater transferred to other persons.

PROVISIONS

Standard Provisions

This General Order includes Central Valley Water Board Standard Provisions and Reporting Requirements.

Monitoring and Reporting Program Requirements

This General Order includes a provision that requires compliance with Monitoring and Reporting Program No. R5-2007-0035, and future revisions thereto, or with an individual monitoring and reporting program, as specified by the Central Valley Water Board or the Executive Officer. The Monitoring and Reporting Program requires:

- periodic inspections of the production area and land application areas
- monitoring of manure, process wastewater, crops, and soil
- recording of operation and maintenance activities

- groundwater monitoring
- storm water monitoring
- monitoring of surface water and discharges to surface water
- annual reporting
- annual reporting of groundwater monitoring
- annual storm water reporting
- noncompliance reporting
- discharge reporting

COMPLIANCE SCHEDULE

This General Order establishes a schedule for Dischargers to develop and implement their WMP and NMP and requires them to make interim facility modifications as necessary to protect surface water, improve storage capacity, and improve the facility's nitrogen balance before all infrastructure changes are completed. This General Order requires that all Dischargers submit:

- **By 31 December 2007**
 - Existing Conditions Report (Attachment A).
- **By 1 July 2008**
 - Annual Report including Annual Dairy Facility Assessment (an update to the Preliminary Dairy Facility Assessment of Attachment A) with interim facility modifications considered to be implemented.
 - Statement of Completion of the following items in Attachment C (Nutrient Management Plan):
 - Items I.A.1, I.B, I.C. and I.D. (Land Application information), II (Sampling and Analysis Proposal), IV (Setbacks, Buffers, and Other Alternatives to Protect Surface Water), and VI (Record-Keeping Requirements).
 - The following items in Attachment B (Waste management Plan):
 - Items I.A. I.B, I.C, I.D, I.E, I.F.1.a, I.F.2.a, I.F.3, I.F.4, and I.F.5 (Facility Description) and V (Operation and Maintenance Plan).
 - Identification of Backflow Problems.
 - Proposed interim facility modifications to improve storage capacity and balance nitrogen.

- **By 31 December 2008**
 - Statement of Completion of item V (Field Risk Assessment) of Attachment C.
 - Preliminary Infrastructure Needs Checklist.
- **By 1 July 2009**
 - Annual Report including Annual Dairy Facility Assessment with modifications implemented to date.
 - Documentation of interim facility modifications completion for storage capacity and to balance nitrogen.
 - Nutrient Management Plan – Retrofitting Plan to improve nitrogen balance with schedule.
 - Statement of Completion of items I.A.2 (Land Application Information) and III (Nutrient Budget) of Attachment C.
 - Waste Management Plan with Retrofitting Plan and Schedule
 - Items I.F.1.b and I.F.2.b (Facility Description), II (Storage Capacity), III (Flood Protection), IV (Production Area Design and Construction), and VI (Documentation there are no cross-connections) of Attachment B.
 - Salinity Report.
- **By 1 July 2010**
 - Annual Report including the Annual Dairy Facility Assessment with facility modifications implemented to date.
 - Status on facility retrofitting completed or in progress.
- **By 1 July 2011**
 - Annual Report including the Annual Dairy Facility Assessment with facility modifications implemented to date.
 - Certification of facility retrofitting completion including:
 - Retrofitting to improve nitrogen balance.
 - Items II.C (certification of completion of modifications for storage capacity needs), III.D (certification of completion of modifications for flood protection needs), and IV.C (certification of modifications for production area construction criteria) of Attachment B.

- **By 1 July 2012**
 - Annual Report including the Annual Dairy Facility Assessment with facility modifications implemented to date.
 - Certification that the Nutrient Management Plan has been completely implemented.

ENFORCEMENT

The State Water Board's Water Quality Enforcement Policy (Enforcement Policy) allows progressive enforcement action for violations of waste discharge requirements when appropriate and recommends more formal enforcement as a first response to more consequential violations. Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative dischargers in achieving compliance; 2) compel compliance for repeat violations and recalcitrant violaters; and 3) provide a disincentive for noncompliance. Progressive enforcement actions may begin with informal enforcement actions such as a verbal, written, or electronic communication between the Central Valley Water Board and a Discharger. The purpose of an informal enforcement action is to quickly bring the violation to the discharger's attention and to give the discharger an opportunity to return to compliance as soon as possible. The highest level of informal enforcement is a Notice of Violation.

The Enforcement Policy recommends formal enforcement actions for the highest priority violations, chronic violations, and/or threatened violations. Violations of the General Order that will be considered as high priority violations include, but are not limited to:

1. Any discharge of waste and/or storm water from the production area to surface waters.
2. The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner.
3. The discharge of wastewater to surface water from cropland.
4. Failure to submit notification of a discharge to surface water in violation of the General Order.
5. Falsifying information or intentionally withholding information required by applicable laws, regulations or an enforcement order.
6. Failure to submit a Design Report for any new or enlarged existing settling, storage, or retention pond prior to construction and/or Post Construction Report for such construction.

7. Failure to pay annual fee, penalties, or liabilities.
8. Failure to monitor as required.
9. Failure to submit required reports on time.

Information Sheet
Waste Discharge Requirements General Order No. R5-2007-0035
Existing Milk Cow Dairies

Table 1. Regional, State, and National Pond Liner Design Requirements

Central Valley Water Board	Pond Liner Design Requirements
Waste Discharge Requirements General Order No. R5-2007-0035	<p>Tier 1 or Tier 2 option: <u>Tier 1:</u> A pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with Section 20340 of Title 27) between the two liners will be acceptable without a demonstration that the pond design is protective of groundwater quality.</p> <p><u>Tier 2:</u> A pond designed in accordance with California Natural Resource Conservation Service (NRCS) Conservation Practice Standard 313 or equivalent and which the Discharger can demonstrate through submittal of technical reports that the alternative design is protective of groundwater quality as required in General Specification B. 8 of the General Order.</p>
Central Valley Counties	Pond Liner Design Requirements
Kings County	The specific discharge (seepage rate) of process water through the soils lining the bottom and sides of the manure separation pits and lagoons shall not be greater than 1×10^{-6} centimeters per second (cm/sec).
Merced County	Liner shall be designed and constructed with a seepage rate of 1×10^{-6} cm/sec or less (with no credit for manure sealing) and a minimum thickness of one foot.
Solano County	<p><u>Large dairies (700 or more mature dairy cows):</u> Liner placed atop bedrock or foundation materials comprised of (from bottom to top): (1) Two feet of compacted clay with permeability less than or equal to 1×10^{-7} cm/sec, (2) 60 mil high-density polyethylene geomembrane with a permeability less than or equal to 1×10^{-13} cm/sec, (3) Geomembrane filter fabric, and (4) 24-inch thick soil operations layer.</p> <p><u>Medium sized dairies (200 to 699 mature dairy cows):</u> Liner of compacted clay that is a minimum of one foot thick, with maximum permeability of 1×10^{-6} cm/sec.</p> <p><u>Small dairies (14 to 199 mature dairy cows):</u> No pond liner requirements.</p>

Information Sheet
Waste Discharge Requirements General Order No. R5-2007-0035
Existing Milk Cow Dairies

Table 1. Regional, State, and National Pond Liner Design Requirements

Top 10 Milk Producing States (in order of highest to lowest milk production)	Pond Liner Design Requirements
California	Title 27 of the California Code of Regulations: 10% clay and no greater than 10% gravel.
Wisconsin	Wisconsin Natural Resources Conservation Service (NRCS) Practice Standard 313: In-place soils (more than 50 percent fines and three feet thick), clay (maximum permeability of 1×10^{-7} cm/sec), geomembrane (60 mil high density polyethylene or 60 mil linear low density polyethylene), geosynthetic clay liner, or concrete .
New York	No pond liner design requirements.
Pennsylvania	Pennsylvania NRCS Conservation Practice Standard 313: In place soils with acceptable permeability (see Appendix 10D below) or lined (soil liner with maximum seepage rate of 1×10^{-5} cm/sec, flexible membrane, bentonite, soil dispersant, or concrete)
Minnesota	Any material that meets maximum seepage rate of 500 gallons per acre per day (5.0×10^{-7} cm/sec).
Idaho	NRCS Agricultural Waste Management Field Handbook Appendix 10D (see below).
New Mexico	Case-by-case but compacted clay or synthetic is standard, maximum permeability of 1×10^{-7} cm/sec
Michigan	Michigan NRCS Conservation Practice Standard 313: In soils with acceptable permeability (per Appendix 10D (see below) or lined (with one foot compacted earth with maximum seepage rate of 1×10^{-5} cm/sec and a minimum one foot compacted operations layer, flexible membrane, bentonite, or concrete).
Washington	Washington NRCS Conservation Practice Standard 313: Maximum soil permeability of 1×10^{-6} cm/sec or a compacted clay liner, amended soil or synthetic liner required meeting requirements of NRCS Conservation Practice Standards 521A through 521D.
Texas	When no site specific assessment completed, one and a half foot of compacted clay with maximum permeability of 1×10^{-7} cm/sec. Otherwise, “designed and constructed in accordance with technical standards of NRCS, ASAE, ASCE, or ASTM that are in effect at time of construction.”

Information Sheet
Waste Discharge Requirements General Order No. R5-2007-0035
Existing Milk Cow Dairies

Table 1. Regional, State, and National Pond Liner Design Requirements

Natural Resources Conservation Service (NRCS)	Pond Liner Design Requirements
NRCS Agricultural Waste Management Field Handbook Appendix 10D – Geotechnical, Design, and Construction Guidelines	<p>In-place soils at least two feet thick and maximum permeability of 1×10^{-6} cm/sec.</p> <p>Consider liner if: aquifer is unconfined and shallow and/or aquifer is a vital water supply; site underlain by less than two feet soil over bedrock, coarse-grained soils with less than 20 percent low plasticity fines, or soils with flocculated clays or highly plastic clays with blocky structure.</p> <p>Acceptable liners: Compacted clay liner (allowable seepage rate of 1×10^{-6} cm/sec if manure sealing cannot be credited or 1×10^{-5} cm/sec if manure sealing can be credited, minimum thickness of one foot), concrete, geomembranes, or geosynthetic clay liners.</p>
California NRCS Conservation Practice Standard 313	<p>Target maximum seepage rate of 1×10^{-6} cm/sec for all vulnerability/risk categories, except that:</p> <ol style="list-style-type: none"> (1) Synthetic liner required when aquifer vulnerability and risk are high (i.e., groundwater is within five to 20 feet of the pond bottom or coarse soils are present <u>and</u> the pond is within 600 feet from a domestic supply well), or (2) Other storage alternatives required when the aquifer vulnerability and risk are very high (i.e., groundwater is within five feet of the pond bottom or the pond is less than 600 feet from an improperly abandoned well <u>and</u> the pond is less than 1,500 feet from a public supply well or less than 100 feet from a domestic supply well).

ATTACHMENT A

Existing Conditions Report For Existing Milk Cow Dairies

DAIRY FACILITY INFORMATION

A. NAME OF DAIRY OR BUSINESS OPERATING THE DAIRY: _____

PHYSICAL ADDRESS OF DAIRY:

Number and Street	City	County	Zip Code
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STREET AND NEAREST CROSS STREET (IF NO ADDRESS): _____

COUNTY ASSESSOR PARCEL NUMBER(S) FOR DAIRY FACILITY: _____

COUNTY ASSESSOR PARCEL NUMBER(S) FOR EACH LAND APPLICATION AREA (WHERE MANURE AND/OR PROCESS WASTEWATER IS APPLIED UNDER CONTROL OF THE OWNER OR OPERATOR WHETHER IT IS OWNED, RENTED, OR LEASED):

B. OPERATOR NAME: _____ TELEPHONE NO. _____

MAILING ADDRESS OF OPERATOR OF DAIRY: _____

Number And Street	City	Zip Code
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C. NAME OF LEGAL OWNER OF THE DAIRY PROPERTY: _____

MAILING ADDRESS OF LEGAL OWNER:

Number and Street	City	Zip Code
-------------------	------	----------

CONTACT PERSON: _____ TELEPHONE NO. _____

D. PERSON TO RECEIVE REGIONAL BOARD CORRESPONDENCE (CHECK): OWNER OPERATOR BOTH

DAIRY FACILITY ASSESSMENT

A. WASTE MANAGEMENT PLAN AND NUTRIENT MANAGEMENT PLAN:

HAVE YOU COMPLETED A WASTE MANAGEMENT PLAN AND NUTRIENT MANAGEMENT PLAN IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO.R5-2007-0035?
 YES NO

IF YES, PLEASE ATTACH A COPY OF THE WASTE MANAGEMENT PLAN AND NUTRIENT MANAGEMENT PLAN TO THIS REPORT.

IF NO, PLEASE COMPLETE A PRELIMINARY FACILITY ASSESSMENT OF YOUR DAIRY AS DESCRIBED IN B BELOW.

B. PRELIMINARY DAIRY FACILITY ASSESSMENT:

IF YOU HAVE NOT COMPLETED A WASTE MANAGEMENT PLAN AND NUTRIENT MANAGEMENT PLAN AS DESCRIBED IN A, ABOVE, PLEASE COMPLETE AND ATTACH A PRELIMINARY DAIRY FACILITY ASSESSMENT¹ FOR YOUR DAIRY. THE PRELIMINARY DAIRY FACILITY ASSESSMENT IS AVAILABLE ELECTRONICALLY ON THE CENTRAL VALLEY

¹ THE PRELIMINARY DAIRY FACILITY ASSESSMENT IS ONLY INTENDED TO PROVIDE A PRELIMINARY ASSESSMENT OF YOUR DAIRY FACILITY'S ABILITY TO STORE WASTEWATER GENERATED AT YOUR DAIRY AND THE ABILITY OF YOUR CROPLAND TO UTILIZE THE NUTRIENTS GENERATED AT YOUR DAIRY. IT WILL PROVIDE: (1) A PRELIMINARY ESTIMATE OF YOUR DAIRY'S WASTEWATER STORAGE NEEDS VERSUS THE EXISTING WASTEWATER STORAGE CAPACITY; AND (2) A PRELIMINARY ESTIMATE OF THE NITROGEN AND PHOSPHORUS GENERATED AT, AND IMPORTED TO, YOUR DAIRY, THE NITROGEN AND PHOSPHORUS REMOVED BY CROPS GROWN AT YOUR DAIRY, AND THE NITROGEN AND PHOSPHORUS EXPORTED FROM YOUR DAIRY. THE PRELIMINARY FACILITY ASSESSMENT IS NOT A SUBSTITUTE FOR A WASTE MANAGEMENT PLAN OR NUTRIENT MANAGEMENT PLAN AND SHOULD NOT BE USED FOR DESIGN PURPOSES. THE PRELIMINARY DAIRY FACILITY ASSESSMENT WAS DEVELOPED BY THE MERCED COUNTY ENVIRONMENTAL HEALTH DEPARTMENT IN

WATER BOARD WEBSITE AT:

http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/complying_with_general_order/software/index.shtml.

THE ASSESSMENT MUST BE COMPLETED ELECTRONICALLY AND A COPY OF THE RESULTS ATTACHED TO THIS EXISTING CONDITIONS REPORT THAT YOU SUBMIT TO THE EXECUTIVE OFFICER.

ADDITIONAL DAIRY FACILITY INFORMATION

A. REPORT OF WASTE DISCHARGE SUBMITTED:

IS ALL OF THE INFORMATION YOU PROVIDED IN THE REPORT OF WASTE DISCHARGE THAT WAS DUE ON 17 OCTOBER 2005 STILL CORRECT? YES NO

IF NO, PLEASE ATTACH A COPY OF YOUR REPORT OF WASTE DISCHARGE WITH THE CORRECTED INFORMATION AND YOUR CORRECTIONS INITIALED AND DATED.

B. GROUNDWATER MONITORING:

ARE THERE ANY GROUNDWATER MONITORING WELLS AT YOUR DAIRY? YES NO

HAS A MONITORING WELL INSTALLATION AND SAMPLING PLAN BEEN SUBMITTED TO THE CENTRAL VALLEY WATER BOARD? YES NO

IS GROUNDWATER MONITORING BEING CONDUCTED AT YOUR DAIRY? YES NO

C. SUBSURFACE (TILE) DRAINAGE:

DO ANY OF YOUR LAND APPLICATION AREAS HAVE A SUBSURFACE (TILE) DRAINAGE SYSTEM?
 YES NO

IF YES, PLEASE INDICATE BELOW THE ASSESSOR PARCEL NUMBER FOR EACH LAND APPLICATION AREA THAT HAS A SUBSURFACE (TILE) DRAINAGE SYSTEM AND THE POINT OF DISCHARGE (E.G., DRAINAGE DITCH, CREEK, STREAM, EVAPORATION BASIN):

ASSESSOR PARCEL NUMBER(S)	POINT OF DISCHARGE
_____	_____
_____	_____
_____	_____

D. THIRD PARTY USE OF PROCESS WASTEWATER:

DO YOU PROVIDE PROCESS WASTEWATER TO A THIRD PARTY FOR THEIR OWN USE?

YES NO

IF YES, YOU MUST ATTACH TO THIS REPORT A COPY OF A WRITTEN AGREEMENT WITH EACH SUCH THIRD PARTY. THE WRITTEN AGREEMENT MUST COMPLY WITH LAND APPLICATION SPECIFICATION C.2 OF WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035.

E. ANAEROBIC DIGESTERS:

DOES YOUR DAIRY TREAT PROCESS WASTEWATER IN AN ANAEROBIC DIGESTER? YES NO

F. MORTALITY:

INDICATE HOW MORTALITY IS HANDLED:

RENDERING SERVICE _____ BURIAL _____ OTHER (DESCRIBE) _____

G. CHEMICAL USE:

INDICATE ALL CHEMICALS USED AT THE FACILITY THAT ARE STORED IN THE WASTE STORAGE SYSTEM OR THAT COULD BE DISCHARGED TO SURFACE WATER OR GROUNDWATER AND THE APPROXIMATE AMOUNTS USED ANNUALLY (ATTACH ADDITIONAL SHEETS AS NECESSARY):

	<u>TYPE</u>	<u>APPROXIMATE ANNUAL AMOUNT USED</u>
SOAPS	_____	_____
DISINFECTANTS	_____	_____
PESTICIDES	_____	_____
FOOTBATHS	_____	_____
OTHER	_____	_____

H. SITE MAP:

PROVIDE A SITE MAP (AERIAL OR TOPOGRAPHIC) OF YOUR DAIRY WHICH SHOWS THE FOLLOWING IN SUFFICIENT DETAIL: DAIRY FACILITY PROPERTY BOUNDARIES; LOCATIONS OF ALL MONITORING, DOMESTIC, AND IRRIGATION WELLS; PROCESS WASTEWATER RETENTION PONDS; MILKING PARLOR; ANIMAL HOUSING; CORRALS; AND ALL LAND APPLICATION AREAS WITH IDENTIFICATION OF LAND USED FOR APPLICATION OF MANURE AND/OR PROCESS WASTEWATER.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) COMPLIANCE

A. WAS YOUR DAIRY OPERATING AT ITS CURRENT LOCATION AS OF 17 OCTOBER 2005? ____ YES ____ NO

IF YES, HAS YOUR DAIRY EXPANDED BY MORE THAN 15% SINCE 17 OCTOBER 2005? ____ YES ____ NO

IF YES (I.E., YOUR DAIRY DID EXPAND BY MORE THAN 15%), DID YOU SUBMIT A REPORT OF WASTE DISCHARGE (ROWD) TO THE CENTRAL VALLEY WATER BOARD FOR THE EXPANSION? ____ YES ____ NO

CERTIFICATION

"I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. IN ADDITION, I CERTIFY THAT THE PROVISIONS OF WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO. R5-2007-0035, INCLUDING THE DEVELOPMENT AND IMPLEMENTATION OF A NUTRIENT MANAGEMENT PLAN AND WASTE MANAGEMENT PLAN, WILL BE COMPLIED WITH."

 SIGNATURE OF OWNER OF FACILITY

 SIGNATURE OF OPERATOR OF FACILITY

 PRINT OR TYPE NAME

 PRINT OR TYPE NAME

 TITLE AND DATE

 TITLE AND DATE

ATTACHMENT B

Waste Management Plan for the Production Area For Existing Milk Cow Dairies

A Waste Management Plan (WMP) for the production area is required for all existing milk cow dairies subject to Waste Discharge Requirements General Order No. R5-2007-0035 and shall address all of the items below. The portions of the WMP that are related to facility and design specifications (items II and III) must be prepared by, or under the responsible charge of, and certified by a civil engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work.

The purpose of the WMP is to ensure that the production area of the dairy facility is designed, constructed, operated and maintained so that dairy wastes generated at the dairy are managed in compliance with Waste Discharge Requirements General Order No. R5-2007-0035 in order to prevent adverse impacts to groundwater and surface water quality.

- I. A description of the facility that includes:
 - A. The name of the facility and the county in which it is located;
 - B. The address, Assessor's Parcel Number, and Township, Range, Section(s), and Baseline Meridian of the property;
 - C. The name(s), address(es), and telephone number(s) of the property owner(s), facility operator(s), and the contact person for the facility;
 - D. Present and maximum animal population as indicated below (this information is in the Report of Waste Discharge submitted in response to the Central Valley Water Board's 8 August 2005 request);

Type of Animals	Present Number of Animals	Maximum Number of Animals in Past 12 months	Breed of Animals
Milking Cows			
Dry Cows			
Heifers: 15 – 24 months			

Type of Animals	Present Number of Animals	Maximum Number of Animals in Past 12 months	Breed of Animals
Heifers: 7 to 14 months			
Heifers: 4 to 6 months			
Calves: up to 3 months			
Other types of commercial animals			

- E. Total volume (gallons) of process wastewater (e.g., milk barn washwater, fresh (not recycled) corral flush water, etc.) generated daily and how this volume was determined; and
- F. A Site Map (or Maps) of appropriate scale to show property boundaries and the following in sufficient detail:
 - 1. The location of the features of the production area including:
 - a. Structures used for animal housing, milk parlor, and other buildings; corrals and ponds; solids separation facilities (settling basins or mechanical separators); other areas where animal wastes are deposited or stored; feed storage areas; drainage flow directions and nearby surface waters; all water supply wells (domestic, irrigation, and barn wells) and groundwater monitoring wells; and
 - b. Process wastewater conveyance structures, discharge points, and discharge/mixing points with irrigation water supplies; pumping facilities and flow meter locations; upstream diversion structures, drainage ditches and canals, culverts, drainage controls (berms/levees, etc.), and drainage easements; and any additional components of the waste handling and storage system.
 - 2. The location and features of all land application areas (land under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) including:

- a. A field identification system (Assessor's Parcel Number; field by name or number; total acreage of each field; crops grown; indication if each field is owned, leased, or used pursuant to a formal agreement); indication what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field; and
 - b. Process wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements.
 3. The location of all cropland that is part of the dairy but is not used for dairy waste application including the Assessor's Parcel Number, total acreage, crops grown, and information on who owns or leases the field. The Waste Management Plan shall indicate if such cropland is covered under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R5-2006-0053 for Coalition Group or Order No. R5-2006-0054 for Individual Discharger, or updates thereto);
 4. The location of all off-property domestic wells within 600 feet of the production area or land application area(s) associated with the dairy and the location of all municipal supply wells within 1,500 feet of the production area or land application area(s) associated with the dairy; and
 5. A map scale, vicinity map, north arrow, and the date the map was prepared. The map shall be drawn on a published base map (e.g., a topographic map or aerial photo) using an appropriate scale that shows sufficient details of all facilities.
- II. An engineering report demonstrating that the existing facility has adequate containment capacity. The report shall include calculations showing if the existing containment structures are able to retain all facility process wastewater generated, together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm.

- A. The determination of the necessary storage volume shall reflect:
1. The maximum period of time, as defined in the Nutrient Management Plan (item III.B of Attachment C), anticipated between land application events (storage period), which shall consider application of process wastewater or manure to the land application area as allowed by Waste Discharge Requirements General Order No. R5-2007-0035 using proper timing and rate of applications;
 2. Manure, process wastewater, and other wastes accumulated during the storage period;
 3. Normal precipitation, or normal precipitation times a factor of one and a half, less evaporation on the surface area during the entire storage period. If normal precipitation is used in the calculation of necessary storage volume, the Waste Management Plan shall include a Contingency Plan as specified in II.C below;
 4. Normal runoff (runoff from normal precipitation), or runoff due to normal precipitation times a factor of one and a half, from the production area during the storage period. If normal runoff is used in the calculation of necessary storage volume, the Waste Management Plan shall include a Contingency Plan as specified in II.C below;
 5. 25-year, 24-hour precipitation on the surface (at the required design storage volume level) of the facility;
 6. 25-year, 24-hour runoff from the facility's drainage area;
 7. Residual solids after liquids have been removed; and
 8. Necessary freeboard (one foot of freeboard for belowground retention ponds and two feet of freeboard for aboveground retention ponds).
- B. If the existing facility's storage capacity is inadequate, the WMP shall include proposed modifications or improvements. Any proposed modifications or improvements must be: prepared by, or under the responsible charge of, and certified by a civil engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work; and include:
1. Design calculations demonstrating that adequate containment will be achieved;

2. Details on the liner and leachate collection and removal system (if appropriate) materials;
 3. A schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of Waste Discharge Requirements General Order No. R5-2007-0035;
 4. A construction quality assurance plan describing testing and observations need to document construction of the pond in accordance with the design and Sections 20323 and 20324 of Title 27; and
 5. An operation and maintenance plan for the pond.
- C. Contingency Plan: If the necessary storage volume calculated in II.A or II.B above is based on normal precipitation and/or runoff rather than precipitation or runoff from normal precipitation times a factor of one and a half (see II.A.3 and II.A.4 above), then the engineering report shall include a Contingency Plan that includes a plan on how the excess precipitation and/or runoff that is generated during higher than normal precipitation will be managed. If the Contingency Plan includes plans to discharge the excess runoff and/or precipitation to land without being in conformance with the NMP, then the Contingency Plan shall include a Monitoring Well Installation and Sampling Plan (MWISP) with a schedule for implementation that proposes monitoring wells to determine the impacts of such disposal on groundwater quality.
- III. An engineering report showing if the facility has adequate flood protection. If the Discharger can provide to the Executive Officer an appropriate published flood zone map that shows the facility is outside the relevant flood zone, an engineering report showing adequate flood protection is not required for that facility. The engineering report shall include a map and cross-sections to scale, calculations, and specifications as necessary. The engineering report shall also describe the size, elevation, and location of all facilities present to protect the facility from inundation or washout as follows:
- A. For facilities in the Sacramento River and San Joaquin River Basins showing if:
 1. The ponds and manured areas at facilities in operation on or before November 27, 1984 are protected from inundation or washout by overflow from any stream channel during 20-year peak storm flow; or

2. Existing facilities in operation on or before November 27, 1984 that are protected against 100-year peak storm flows will continue such protection; or
 3. Facilities, or portions thereof, which began operation after November 27, 1984, are protected against 100-year peak storm flows.
- B. For facilities in the Tulare Lake Basin showing if the facility is protected from overflow from stream channels during 20-year peak stream flows for facilities that existed as of 25 July 1975 and protected from 100-year peak stream flows for facilities constructed after 25 July 1975. Facilities expanded after 8 December 1984 must be protected from 100-year peak stream flows.
- C. If the facility's flood protection does not meet these minimum requirements, the WMP shall include proposed modifications or improvements with the corresponding design to achieve the necessary flood protection and a schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of Waste Discharge Requirements General Order No. R5-2007-0035.
- IV. A report assessing if the animal confinement areas, animal housing, and manure and feed storage areas are designed and constructed properly.
- A. The report shall assess if the following design and construction criteria are met:
1. Corrals and/or pens are designed and constructed to collect and divert all process wastewater to the retention pond;
 2. The animal housing area (i.e., barn, shed, milk parlor, etc.) is designed and constructed to divert all water that has contacted animal wastes to the retention pond; and
 3. Manure and feed storage areas are designed and constructed to collect and divert runoff and leachate from these areas to the retention pond.
- B. If the facility does not meet the above design and construction criteria, the WMP shall include proposed modifications or improvements to achieve the criteria and a schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of Waste Discharge Requirements General Order No. R5-2007-0035.

- V. An operation and maintenance plan to ensure that:
- A. All precipitation and surface drainage from outside manured areas, including that collected from roofed areas, is diverted away from manured areas, unless such drainage is fully contained and is included in the storage requirement calculations required in item II, above;
 - B. Ponds are managed to maintain the required freeboard and to prevent odors, breeding of mosquitoes, damage from burrowing animals, damage from equipment during removal of solids, embankment settlement, erosion, seepage, excess weeds, algae, and vegetation;
 - C. Holding ponds provide necessary storage volume prior to winter storms (by November 1st at the latest), maintain capacity considering buildup of solids, and comply with the minimum freeboard required in Waste Discharge Requirements General Order No. R5-2007-0035;
 - D. There is no discharge of waste or storm water to surface waters from the production area;
 - E. Procedures have been established for removal of solids from any lined pond to prevent damage to the pond liner;
 - F. Corrals and/or pens are maintained to collect and divert all process wastewater to the retention pond and to prevent ponding of water and to minimize infiltration of water into the underlying soils;
 - G. The animal housing area (e.g., barn, shed, milk parlor, etc.) is maintained to collect and divert all water that has contacted animal wastes to the retention pond and to minimize the infiltration of water into the underlying soils;
 - H. Manure and feed storage areas are maintained to ensure that runoff and leachate from these areas are collected and diverted to the retention pond and to minimize infiltration of leachate from these areas to the underlying soils;
 - I. All dead animals are disposed of properly;
 - J. Chemicals and other contaminants handled at the facility are not disposed of in any manure or process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants;

- K. All animals are prevented from entering any surface water within the confined area; and
 - L. Salt in animal rations is limited to the amount required to maintain animal health and optimum production.
- VI. Documentation from a trained professional (i.e., a person certified by the American Backflow Prevention Association, an inspector from a state or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training) that there are no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the Site Map required in I.F above.
- VII. The certification required in Required Reports and Notices H.2.a of Waste Discharge Requirements General Order No. R5-2007-0035.

ATTACHMENT C

Contents Of A Nutrient Management Plan And Technical Standards For Nutrient Management For Existing Milk Cow Dairies

Waste Discharge Requirements General Order No. R5-2007-0035 (Order) requires owners and operators of existing milk cow dairies (Dischargers) who apply manure, bedding, or process wastewater to land for nutrient recycling to develop and implement management practices that control nutrient losses and that are described in a Nutrient Management Plan (NMP). The purpose of the NMP is to budget and manage the nutrients applied to the land application area(s) considering all sources of nutrients, crop requirements, soil types, climate, and local conditions in order to prevent adverse impacts to surface water and groundwater quality. The NMP must take the site-specific conditions into consideration in identifying steps that will minimize nutrient movement through surface runoff or leaching past the root zone.

The NMP must contain, at a minimum, all of the elements listed below under Contents of a Nutrient Management Plan and must be in conformance with the applicable Technical Standards for Nutrient Management (Technical Standards), also listed below. Note that the NMP must be updated in response to changing conditions, monitoring results and other factors.

A specialist who is certified in developing nutrient management plans shall develop the NMP. A certified specialist is a Professional Soil Scientist, Professional Agronomist, or Crop Advisor certified by the American Society of Agronomy or a Technical Service Provider certified in nutrient management in California by the Natural Resources Conservation Service (NRCS). The Executive Officer may approve alternative proposed specialists. Only NMPs prepared and signed by these parties will be considered certified.

The NMP is linked to other sections of the WDRs. The Monitoring and Reporting Program specifies minimum amounts of monitoring that must be conducted at the dairy. As indicated below, this information must be used to make management decisions related to nutrient management. Likewise, the timing and amounts of wastewater applications to crops must be known to correctly calculate the amount of storage needed in holding ponds.

Wastes and land application areas shall be managed to prevent contamination of crops grown for human consumption. The term "crops grown for human consumption" refers only to crops that will not undergo subsequent processing which adequately removes potential microbial danger to consumers.

Contents of a Nutrient Management Plan

Dairy Facility Assessment

The NMP will include the initial Preliminary Dairy Facility Assessment (Attachment A) and the annual updates as required by Monitoring and Reporting Program No. R5-2007-0035. Copies of these assessments shall be maintained for 10 years.

The NMP shall identify the name and address of the dairy, the dairy operator, and legal owner of the dairy property as reported in the Report of Waste Discharge and shall contain all of the following elements to demonstrate that the Discharger can control nutrient losses that may impact surface water or groundwater quality and comply with the requirements of the Order and the Technical Standards for Nutrient Management (Technical Standards).

I. Land Application Area Information

- A. Identify each land application area (under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) on a single published base map (topographic map or aerial photo) at an appropriate scale which includes:
 1. A field identification system (Assessor's Parcel Number; land application area by name or number; total acreage of each land application area; crops grown; indication if each land application area is owned, rented, or leased by the Discharger; indication what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field; and
 2. Process wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements.

- B. Provide the following information for land application area identified in I.A above:
1. Field's common name (name used when keeping records of waste applications).
 2. Assessor's Parcel Number.
 3. Total acreage.
 4. Crops grown and crop rotation.
 5. Information on who owns and/or leases the field.
 6. Proposed sampling locations for discharges of storm water and tailwater to surface water.
- C. Provide copies of written agreements with third parties that receive process wastewater for their own use from the Discharger's dairy (Technical Standards V.A.1 and V.A.3 below).
- D. Identify each field under the control of the Discharger and within five miles of the dairy where neither process wastewater nor manure is applied. Each field shall be identified on a single published base map at an appropriate scale by the following:
1. Assessor's Parcel Number.
 2. Total acreage.
 3. Information on who owns or leases the field.

Note: The NMP must be updated and the Central Valley Water Board notified in writing before waste is applied to the lands identified in Section D.

II. Sampling and Analysis (see Technical Standard I below)

Identify the sampling methods, sampling frequency, and analyses to be conducted for soil, manure, process wastewater, irrigation water, and plant tissue analysis (Technical Standard I below).

III. Nutrient Budget (see Technical Standard V below)

The Discharger shall develop a nutrient budget for each land application area. The nutrient budget shall establish planned rates of nutrient applications for each crop based on soil test results, manure and process wastewater analyses, irrigation water analyses, crop nutrient requirements and patterns, seasonal and climatic conditions, the use and timing of irrigation water, and the nutrient application restrictions listed in Technical Standards V.A through V.D below. The Nutrient Budget shall include the following:

- A. The rate of application of manure and process wastewater for each crop in each land application area (also considering sources of nutrients other than manure or process wastewater) to meet each crop's needs without exceeding the application rates specified in Technical Standard V.B below. The basis for the application rates must be provided.
 - B. The timing of applications for each crop in each land application area and the basis for the timing (Technical Standard V.C below). The maximum period of time anticipated between land application events (storage period) based on proper timing and compliance with Technical Standard V.C. below. This will be used in the Waste Management Plan (item II.A of Attachment B) to determine the storage capacity needs.
 - C. The method of manure and process wastewater application for each crop in each land application area (Technical Standard V.D below).
 - D. If phosphorus and/or potassium applications exceed the amount of these elements removed from the land application area in the harvested portion of the crop, the soil and crop tissue analyses shall be reviewed by an agronomist at least every five years. If this review determines that the buildup of phosphorus or potassium threatens to reduce the long-term productivity of the soil or the yield, quality or use of the crops grown, application rates will be adjusted downward to prevent or correct the problem.
- IV. Setbacks, Buffers, and Other Alternatives to Protect Surface Water (see Technical Standard VII below)
- A. Identify all potential surface waters or conduits to surface water that are within 100 feet of any land application area.

- B. For each land application area that is within 100 feet of a surface water or a conduit to surface water, identify the setback, vegetated buffer, or other alternative practice that will be implemented to protect surface water (Technical Standard VII below).

V. Field Risk Assessment (see Technical Standard VIII below)

Evaluate the effectiveness of management practices used to control the discharge of waste constituents from land application areas by assessing the water quality monitoring results of discharges of manure, process wastewater, tailwater, subsurface (tile) drainage, or storm water from the land application areas.

VI. Record-Keeping (see Technical Standard IX below)

Identify the records that will be maintained for each land application area identified in I.A above.

VII. Nutrient Management Plan Review (see Technical Standard X below)

- A. Identify the schedule for review and revisions to the NMP.
- B. Identify the person who will conduct the NMP review and revisions.

Technical Standards for Nutrient Management

The Discharger shall comply with the following Technical Standards for Nutrient Management in the development and implementation of the Nutrient Management Plan (NMP).

I. Sampling and Analysis

Soil, manure, process wastewater, irrigation water, and plant tissue shall be monitored, sampled, and analyzed as required in Monitoring and Reporting Program No. R5-2007-0035, and any future revisions thereto. The results of these analyses shall be used during the development and implementation of the NMP.

II. Crop Requirements

- A. Realistic yield goals for each crop in each land application area shall be established. For new crops or varieties, industry yield recommendations may be used until documented yield information is available.
- B. Each crop's nutrient requirements for nitrogen, phosphorus, and potassium shall be determined based on recommendations from the University of California, *Western Fertilizer Handbook* (9th Edition), or from historic crop nutrient removal.

III. Available Nutrients

- A. All sources of nutrients (nitrogen, phosphorus, and potassium) available for each crop in each land application area shall be identified prior to land applications. Potential nutrient sources include, but are not limited to, manure, process wastewater, irrigation water, commercial fertilizers, soil, and previous crops.
- B. Nutrient values of soil, manure, process wastewater, and irrigation water shall be determined based on laboratory analysis. "Book values" for manure and process wastewater may be used for planning of waste applications during the first two years during initial development of the NMP if necessary. Acceptable book values are those values recognized by American Society of Agricultural and Biological Engineers (ASABE), the Natural Resources Conservation Service (NRCS), and/or the University of California that accurately estimate the nutrient content of the material. The nutrient content of commercial

fertilizers shall be derived from California Department of Food and Agriculture published values.

- C. Nutrient credit from previous legume crops shall be determined by methods acceptable to the University of California Cooperative Extension, the NRCS, or a specialist certified in developing nutrient management plans.

IV. Overall Nutrient Balance

If the NMP shows that the nutrients generated by the dairy exceed the amount needed for crop production in the land application area, the Discharger must implement management practices (such as offsite removal of the excess nutrients, treatment, or storage) that will prevent impacts to surface water or groundwater quality due to excess nutrients.

V. Nutrient Budget

The NMP shall include a nutrient budget which includes planned rates of nutrient applications for each crop that do not exceed the crop's requirements for total nitrogen considering the stage of crop growth and that also considers all nutrient sources, climatic conditions, the irrigation schedule, and the application limitations in A through D below.

A. General Standards for Nutrient Applications

1. Prohibition A.8 of the Order: *"The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner or in a manner not approved by the Executive Officer, is prohibited."*
2. Prohibition A. 9 of the Order: *"The land application of manure or process wastewater to cropland for other than nutrient recycling is prohibited."*
3. Land Application Specification C.2 of the Order: *"No later than 31 December 2007, The Discharger shall have a written agreement with each third party that receives process wastewater from the Discharger for its own use. Each written agreement shall be included in the Discharger's Existing Conditions Report, Nutrient Management Plan, and Annual Report. The written agreement(s) shall be effective until the third party is covered under waste discharge requirements or a waiver of waste discharge"*

requirements that are adopted by the Central Valley Water Board. The written agreement shall:

- a. *Clearly identify:*
 - ii. *The Discharger and dairy facility from which the process wastewater originates;*
 - iii. *The third party that will control the application of process wastewater to cropland;*
 - iv. *The Assessor's Parcel Number(s) and the acreage(s) of the cropland where the process wastewater will be applied; and*
 - v. *The types of crops to be fertilized with the process wastewater.*
 - b. *Include an agreement by the third party to:*
 - ii. *Use the process wastewater at agronomic rates appropriate for the crops to be grown; and*
 - iii. *Prevent the runoff to surface waters of wastewater, storm water or irrigation supply water that has come into contact with manure or is blended with wastewater.*
 - c. *Include a certification statement, as specified in General Reporting Requirements C.7 of the Standard Provision and Reporting Requirements (which is attached to and made part of this Order), which is signed by both the Discharger and third party."*
4. Land Application Specification C.4 of the Order: *"The application of animal waste and other materials containing nutrients to any cropland under control of the Discharger shall meet the following conditions:*
- a. *The application is in accordance with a certified Nutrient Management Plan developed and implemented in accordance with Required Reports and Notices H.1.c and Attachment C of this Order; and*
 - b. *Records are prepared and maintained as specified in the Record-Keeping Requirements of Monitoring and Reporting Program No. R5-2007-0035."*

5. Land Application Specification C.5 of the Order: *“The application of waste to cropland shall be at rates that preclude development of vectors or other nuisance conditions and meet the conditions of the certified Nutrient Management Plan.”*
6. Land Application Specification C.7 of the Order: *“All process wastewater applied to land application areas must infiltrate completely within 72 hours after application.”*
7. Land Application Specification C.8 of the Order: *“Process wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified Nutrient Management Plan.”*
8. Provision E.6 of the Order: *“This Order does not apply to facilities where wastes such as, but not limited to, whey, cannery wastes, septage, municipal or industrial sludge, municipal or industrial biosolids, ash or similar types of waste are generated onsite or are proposed to be brought onto the dairy or associated cropland for the purpose of nutrient recycling or disposal. The Discharger shall submit a complete Report of Waste Discharge and receive WDRs or a waste-specific waiver of WDRs from the Central Valley Water Board prior to receiving such waste.”*
9. Plans for nutrient management shall specify the form, source, amount, timing, and method of application of nutrients on each land application area to minimize nitrogen and/or phosphorus movement to surface and/or ground waters to the extent necessary to meet the provisions of the Order.
10. Where crop material is not removed from the land application area, waste applications are not allowed. For example, if a pasture is not grazed or mowed (and cuttings removed from the land application area), waste shall not be applied to the pasture.
11. Manure and/or process wastewater will be applied to the land application area for use by the first crop covered by the NMP only to the extent that soil tests indicate a need for nitrogen application.
12. Supplementary commercial fertilizer(s) and/or soil amendments may be added when the application of nutrients contained in manure and/or process wastewater alone is not sufficient to meet

the crop needs, as long as these applications do not exceed provisions of the Order.

13. Nutrient applications to a crop shall not be made prior to the harvest of the previous crop except where the reason for such applications is provided in the NMP.
14. Water applications shall not exceed the amount needed for efficient crop production.
15. Nutrients shall be applied in such a manner as not to degrade the soil's structure, chemical properties, or biological condition.

B. Nutrient Application Rates

1. General

- a. Planned rates of nutrient application shall be determined based on soil test results, crop tissue test results, nutrient credits, manure and process wastewater analysis, crop requirements and growth stage, seasonal and climatic conditions, and use and timing of irrigation water. Actual applications of nitrogen to any crop shall be limited to the amounts specified below.
- b. Nutrient application rates shall not attempt to approach a site's maximum ability to contain one or more nutrients through soil adsorption. Excess applications or applications that cause soil imbalances should be avoided. Excess manure nutrients generated by the Discharger must be handled by export to a good steward of the manure, or the development of alternative uses.

2. Nitrogen

- a. Total nitrogen applications to a land application area prior to and during the growing of a crop will be based on pre-plant or pre-side dress soil analysis to establish residual nitrogen remaining in the field from the previous crop to establish early season nitrogen applications. Pre-plant or side dress nitrogen applications will not exceed the estimated total crop use as established by the nutrient management plan. Except as allowed below, application rates shall not result in total nitrogen applied to the land application areas exceeding

1.4 times the nitrogen that will be removed from the field in the harvested portion of the crop. Additional applications of nitrogen are allowable if the following conditions are met:

- i. Plant tissue testing has been conducted and it indicates that additional nitrogen is required to obtain a crop yield typical for the soils and other local conditions;
 - ii. The amount of additional nitrogen applied is based on the plant tissue testing and is consistent with University of California Cooperative Extension written guidelines or written recommendations from a professional agronomist;
 - iii. The form, timing, and method of application facilitates timely nitrogen availability to the crop; and
 - iv. Records are maintained documenting the need for additional applications.
- b. If, in calendar year 2012 or later years, application of total nitrogen to a land application area exceeds 1.65 times total nitrogen removed from the land application area through the harvest and removal of the previous crop, the Discharger shall either revise the NMP to immediately prevent such exceedance or submit a report demonstrating that the application rates have not and will not pollute surface or ground water.

3. Phosphorus and Potassium

- a. Phosphorus and potassium may be applied in excess of crop uptake rates. If, however, monitoring indicates that levels of these elements are causing adverse impacts, corrective action must be taken. Cessation of applications may be necessary until crop uptake and harvest has reduced the concentration in the soil.

Important Note:

Use of animal manure as a primary source of nitrogen commonly results in applications of phosphorus and potassium at rates that exceed crop needs. Over time, these elements build up in the soils and can cause adverse impacts. For example, phosphorus will leave the land application area in surface runoff and

contribute to excessive algae growth in receiving waters and potassium can build up in crops to the point of limiting their use as animal feed. Application of these nutrients at agronomic levels, along with reasonable erosion control and runoff control measures, will normally prevent such problems.

Nutrients are being evaluated in several Central Valley surface waters. Where these studies show that nutrients are adversely impacting beneficial uses, the Regional Water Board will work with parties in the watershed, including dairies, to reduce discharges of phosphorus, nitrogen and possibly other constituents.

C. Nutrient Application Timing

1. Process wastewater application is not the same as irrigation. Process wastewater application scheduling should be based on the nutrient needs of the crop, the daily water use of the crop, the water holding capacity of the soil, and the lower limit of soil moisture for each crop and soil.
2. Wastewater shall not be applied when soils are saturated. During the rainy season rainfall can exceed crop water demand. However, the application of wastewater is allowable if tests show that there is an agronomic need and current conditions indicate that threat of nitrate leaching is minimal.
3. The timing of nutrient application must correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, and land application area accessibility.
4. Nutrient applications for spring-seeded crops shall be timed to avoid surface runoff and leaching by winter rainfall.
5. Except for orchards and vineyards, nutrients shall not be applied during periods when a crop is dormant.

D. Nutrient Application Methods

1. The Discharger shall apply nutrient materials uniformly to application areas or as prescribed by precision agricultural techniques.

2. Land Application Specification C.6 of the Order: *“Land application areas that receive dry manure shall be managed through implementation of erosion control measures to minimize erosion and must be consistent with a certified Nutrient Management Plan.”*

VI. Wastewater Management on Land Application Areas

Control of water and process wastewater applications and runoff is a part of proper nutrient management since water transports nutrients, salts, and other constituents from cropland to groundwater and surface water. The Discharger shall comply with the following provisions of the Order, which place requirements on applications of manure and process wastewater to, and runoff from, cropland:

- A. Prohibition A.3 of the Order: *“The discharge of waste from existing milk cow dairies to surface waters which causes or contributes to an exceedance of any applicable water quality objective in the Basin Plans or any applicable state or federal water quality criteria, or a violation of any applicable state or federal policies or regulations is prohibited.”*
- B. Prohibition A.4 of the Order: *“The collection, treatment, storage, discharge or disposal of wastes at an existing milk cow dairy that results in (1) discharge of waste constituents in a manner which could cause degradation of surface water or groundwater except as allowed by this Order, (2) contamination or pollution of surface water or groundwater, or (3) a condition of nuisance (as defined by the California Water Code Section 13050) is prohibited.”*
- C. Prohibition A.10 of the Order: *“The discharge of wastewater to surface waters from cropland is prohibited. Irrigation supply water that comes into contact or is blended with waste or wastewater shall be considered wastewater under this Prohibition.”*
- D. Prohibition A.11 of the Order: *“The application of process wastewater to a land application area before, during, or after a storm event that would result in runoff of the applied water is prohibited.”*
- E. Prohibition A.12 of the Order: *“The discharge of storm water to surface water from a land application area where manure or process wastewater has been applied is prohibited unless the land application area has been managed consistent with a certified Nutrient Management Plan.”*

- F. Land Application Specification C.3 of the Order: *“Land application of wastes for nutrient recycling from existing milk cow dairies shall not cause the underlying groundwater to contain any waste constituent, degradation product, or any constituent of soil mobilized by the interactions between applied wastes and soil or soil biota, to exceed the groundwater limitations set forth in this Order.”*
- G. Land Application Specification C.7 of the Order: *“All process wastewater applied to land application areas must infiltrate completely within 72 hours after application.”*
- H. Land Application Specification C.8 of the Order: *“Process wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified Nutrient Management Plan (see Attachment C).”*

VII. Setbacks and Vegetated Buffer

- A. Land Application Specification C.9 of the Order: *“Manure and process wastewater shall not be applied closer than 100 feet to any down gradient surface waters, open tile line intake structures, sinkholes, agricultural or domestic well heads, or other conduits to surface waters, unless a 35-foot wide vegetated buffer or physical barrier is substituted for the 100-foot setback or alternative conservation practices or field-specific conditions will provide pollutant reductions equivalent or better than the reductions achieved by the 100-foot setback.”*
- B. A setback is a specified distance from surface waters or potential conduits to surface waters where manure and process wastewater may not be land applied, but where crops may continue to be grown.
- C. A vegetated buffer is a narrow, permanent strip of dense perennial vegetation where no crops are grown and which is established parallel to the contours of and perpendicular to the dominant slope of the land application area for the purposes of slowing water runoff, enhancing water infiltration, trapping pollutants bound to sediment, and minimizing the risk of any potential nutrients or pollutants from leaving the land application area and reaching surface waters.
- D. The minimum widths of setbacks and vegetated buffers must be doubled around the wellhead of a drinking water supply well constructed in a sole-source aquifer.

- E. Practices and management activities for vegetated buffers include the following:
1. Removal of vegetation in vegetated buffers will be in accordance with site production limitations, rate of plant growth, and the physiological needs of the plants.
 2. Do not mow below the recommended height for the plant species.
 3. Maintain adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
 4. Maintain adequate ground cover, litter, and canopy to maintain or improve infiltration and soil condition.
 5. Periodic rest from mechanical harvesting may be needed to maintain or restore the desired plant community following episodic events such as drought.
 6. When weeds are a significant problem, implement pest management to protect the desired plant communities.
 7. Prevent channels from forming.

VIII. Field Risk Assessment

The results of the water quality monitoring of discharges of manure, process wastewater, storm water, and tailwater to surface water from each land application area, as required by Monitoring and Reporting Program No. R5-2007-0035, shall be used by the Discharger to assess the movement of nitrogen and phosphorus from each land application area. The Discharger will follow guidelines provided by the Central Valley Water Board in conducting these assessments.

IX. Record-Keeping

The Discharger shall maintain records for each land application area as required in the Record-Keeping Requirements of Monitoring and Reporting Program No. R5-2007-0035.

X. Nutrient Management Plan Review

- A. Provide the name and contact information (including address and phone number) of the person who created the NMP; the date that the NMP was drafted; the name, title, and contact information of the person who approved the final NMP; and the date of NMP implementation.
- B. The NMP shall be updated when discharges from any land application area exceed water quality objectives, a nutrient source has changed, site-specific information has become available to replace defaults values used in the overall nutrient balance or the nutrient budget, nitrogen application rates in any land application area exceed the rates specified in Technical Standard V.B or the Field Risk Assessment finds that management practices are not effective in minimizing discharges.
- C. The NMP shall be updated prior to any anticipated changes that would affect the overall nutrient balance or the nutrient budget such as, but not limited to, a crop rotation change, changes in the available cropland, or the changes in the volume of process wastewater generated.
- D. The Discharger shall review the NMP at least once every five years and notify the Regional Board in the annual report of any proposed changes that would affect the NMP.

ATTACHMENT D

Manure/Process Wastewater Tracking Manifest For Existing Milk Cow Dairies

Instructions:

- 1) Complete one manifest for each hauling event, for each destination. A hauling event may last for several days, as long as the manure is being hauled to the same destination.
- 2) If there are multiple destinations, **complete a separate form for each destination.**
- 3) The operator must obtain the signature of the hauler upon completion of each manure-hauling event.
- 4) The operator shall submit copies of manure/process wastewater tracking manifest(s) with the Annual Monitoring Report for Existing Milk Cow Dairies.

Operator Information:

Name of Operator: _____

Name of Dairy Facility: _____

Facility Address: _____
Number and Street City Zip Code

Contact Person Name and Phone Number: _____
Name Phone Number

Manure/Process Wastewater Hauler Information:

Name of Hauling Company/Person: _____

Address of Hauling Company /Person: _____
Number and Street City Zip Code

Contact Person: _____
Name Phone Number

Destination Information:

Composting Facility / Broker / Farmer / Other (identify) _____ (please circle one)

Contact information of Composting Facility, Broker, Farmer, or Other (as identified above):

Name Number and Street City Zip Code Phone Number

Manure/Process Wastewater Destination Address or Assessor's Parcel Number:

Number and Street City Zip Code Assessor's Parcel Number

Dates Hauled: _____

Amount Hauled:

Enter the amount of manure hauled in tons or cubic yards (indicate the units used), the manure solids content (if amount reported in tons) or manure density (if amount reported in cubic yards), and the method used to calculate the amount:

Manure: _____ Tons or Cubic Yards (indicate which units used)

Manure Solids Content (if amount reported in tons): _____

Manure Density (if amount reported in cubic yards): _____

Method used to determine amount of manure: _____

Enter the amount of process wastewater hauled in gallons and the method used to determine the amount.

Process Wastewater: _____ Gallons

Method used to determine volume of process wastewater: _____

Written Agreement:

Does the Operator have a written agreement (in compliance with Land Application Specification C.2 of Waste Discharge Requirements General Order No. R5-2007-0035) with any party that receives process wastewater from the Operator for its own use? (please check one)

____ Yes _____ No

If the answer is no, the Operator agrees to have such a written agreement with any such party for any process wastewater transferred after **31 December 2007** to such party.

_____ (Operator shall provide initials here to acknowledge this requirement).

Certification:

I declare under the penalty of law that I personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Operator's Signature: _____ Date: _____

Hauler's Signature: _____ Date: _____

ATTACHMENT D

Manure/Process Wastewater Tracking Manifest For Existing Milk Cow Dairies

Instructions:

- 1) Complete one manifest for each hauling event, for each destination. A hauling event may last for several days, as long as the manure is being hauled to the same destination.
- 2) If there are multiple destinations, **complete a separate form for each destination.**
- 3) The operator must obtain the signature of the hauler upon completion of each manure-hauling event.
- 4) The operator shall submit copies of manure/process wastewater tracking manifest(s) with the Annual Monitoring Report for Existing Milk Cow Dairies.

Operator Information:

Name of Operator: _____

Name of Dairy Facility: _____

Facility Address: _____
Number and Street City Zip Code

Contact Person Name and Phone Number: _____
Name Phone Number

Manure/Process Wastewater Hauler Information:

Name of Hauling Company/Person: _____

Address of Hauling Company /Person: _____
Number and Street City Zip Code

Contact Person: _____
Name Phone Number

Destination Information:

Composting Facility / Broker / Farmer / Other (identify) _____ (please circle one)

Contact information of Composting Facility, Broker, Farmer, or Other (as identified above):

Name Number and Street City Zip Code Phone Number

Manure/Process Wastewater Destination Address or Assessor's Parcel Number:

Number and Street City Zip Code Assessor's Parcel Number

Dates Hauled: _____

Amount Hauled:

Enter the amount of manure hauled in tons or cubic yards (indicate the units used), the manure solids content (if amount reported in tons) or manure density (if amount reported in cubic yards), and the method used to calculate the amount:

Manure: _____ Tons or Cubic Yards (indicate which units used)

Manure Solids Content (if amount reported in tons): _____

Manure Density (if amount reported in cubic yards): _____

Method used to determine amount of manure: _____

Enter the amount of process wastewater hauled in gallons and the method used to determine the amount.

Process Wastewater: _____ Gallons

Method used to determine volume of process wastewater: _____

Written Agreement:

Does the Operator have a written agreement (in compliance with Land Application Specification C.2 of Waste Discharge Requirements General Order No. R5-2007-0035) with any party that receives process wastewater from the Operator for its own use? (please check one)

Yes No

If the answer is no, the Operator agrees to have such a written agreement with any such party for any process wastewater transferred after **31 December 2007** to such party.

_____ (Operator shall provide initials here to acknowledge this requirement).

Certification:

I declare under the penalty of law that I personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Operator's Signature: _____ Date: _____

Hauler's Signature: _____ Date: _____

ATTACHMENT E

Definitions For Existing Milk Cow Dairies

1. "Agronomic rates" is defined as the land application of irrigation water and nutrients (which may include animal manure, bedding, or process wastewater) at rates of application in accordance with a plan for nutrient management that will enhance soil productivity and provide the crop or forage growth with needed nutrients for optimum health and growth.
2. "Anaerobic digester" is defined as a basin, pond, or tank designed, constructed, maintained, and operated for the anaerobic treatment of liquid or solid animal waste and which promotes the decomposition of manure or "digestion" of the organics in manure to simple organics and gaseous biogas products.
3. "Aquifer" is defined as ground water that occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs.
4. "Artificial recharge area" is defined as an area where the addition of water to an aquifer is by human activity, such as putting surface water into dug or constructed spreading basins or injecting water through wells.
5. "Central Valley Water Board" is defined as the California Regional Water Quality Control Board, Central Valley Region.
6. "Certified Nutrient Management Plan" is defined as a nutrient management plan that is prepared and signed by a specialist who is certified in developing nutrient management plans. A certified specialist is: a Professional Soil Scientist, Professional Agronomist, Professional Crop Scientist, or Crop Advisor certified by the American Society of Agronomy; a Technical Service Provider certified in nutrient management in California by the Natural Resources Conservation Service; or other specialist approved by the Executive Officer.
7. "Confined animal facility" is defined in Title 27 CCR Section 20164 as "... *any place where cattle, calves, sheep, swine, horses, mules, goats, fowl, or other domestic animals are corralled, penned, tethered, or otherwise enclosed or held and where feeding is by means other than grazing.*"
8. "Confined area" is defined as the area where cows are confined within the production area.
9. "Cropland" is defined as the land application area where dry or solid manure and/or process wastewater is recycled for the purpose of beneficially using the nutrient value of the manure and/or process wastewater for crop production.

10. "Degradation" is defined as any measurable adverse change in water quality.
11. "Discharge" is defined as the discharge or release of waste to land, surface water, or ground water.
12. "Discharger" is defined as the property owner and the operator of an existing milk cow dairy subject to Waste Discharge Requirements General Order No. R5-2007-0035.
13. "Existing facility" is defined, consistent with Title 14 CCR Section 15301, as a milk cow dairy subject to Waste Discharge Requirements General Order No. R5-2007-0035 that is fully constructed and operating as of 17 October 2005 and which has subsequently undergone no expansion in the size or scope of its herd, facilities, or operation.
14. "Existing herd size" is defined as the maximum number of mature dairy cows reported in the herd on 17 October 2005 plus or minus 15 percent of that reported number to account for the normal variation in herd sizes.
15. "Expansion" is defined as, but not limited to, any increase in the existing herd size (i.e., by more than 15 percent of the maximum number of mature dairy cows in the herd on 17 October 2005) or an increase in the storage capacity of the retention ponds or acquisition of more acreage for reuse of nutrients from manure or process wastewater in order to accommodate an expansion of the existing herd size. "Expansion" does not include installation or modification of facilities or equipment to achieve compliance with the requirements of Waste Discharge Requirements General Order No. R5-2007-0035 so long as the modification or installation is sized to accommodate only the existing herd size.
16. "Facility" is defined as the property identified as such in Waste Discharge Requirements General Order No. R5-2007-0035.
17. "Field moisture capacity" is defined as "the upper limit of storable water in the soil once free drainage has occurred after irrigation or precipitation."
18. "Freeboard" is defined as the elevation difference between the process wastewater (liquid) level in a pond and the lowest point of the pond embankment before it can overflow.
19. "Incorporation into soil" is defined as the complete infiltration of process wastewater into the soil, the disking or rotary tiller mixing of manure into the soil, shank injection of slurries into soil, or other equally effective methods

20. "Irrigation return flow" is defined as surface and subsurface water that leaves a field following application of irrigation water.
21. "Land application area" is defined as land under control of the milk cow dairy owner or operator, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling.
22. "Manure" is defined as the fecal and urinary excretion of livestock and other commingled materials. Manure may include bedding, compost, and waste feed.
23. "Manured solids" is defined as manure that has a sufficient solids content such that it will stack with little or no seepage.
24. "Mature dairy cow" is defined as a dairy cow that has produced milk at any time during her life.
25. "Normal precipitation" is defined as the long-term average precipitation based on monthly averages over the time that data has been collected at a particular weather station. Normal precipitation is usually taken from data averaged over a 30-year period (e.g. 1971 to 2000) if such data is available.
26. "Nuisance" is defined in the Porter-Cologne Water Quality Control Act as
"...anything which meets all of the following requirements:
 - (1) *Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.*
 - (2) *Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.*
 - (3) *Occur during, or as a result of, the treatment or disposal of wastes."*
27. "Nutrient" is defined as any element taken in by a plant which is essential to its growth and which is used by the plant in elaboration of its food and tissue.
28. "Nutrient recycling" is defined as the application of nutrients at agronomic rates for crop production.
29. "Off-property discharge" is defined as the discharge or release of waste beyond the boundaries of the property of the dairy's production area or the land application area or to water bodies that run through the production area or land application area.
30. "Open tile line intake structure" is defined as an air vent for a subsurface (tile) drain system.

31. "Order" is defined as the Waste Discharge Requirements General Order.
32. "Overflow" is defined as the intentional or unintentional diversion of flow from the collection, treatment, land application, and conveyance systems, including pumping facilities.
33. "Pollutant" is defined in Title 40 Code of Federal Regulations Section 122.2 as *"...dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."*
34. "Pollution" is defined in Section 13050(l)(1) of the Porter-Cologne Water Quality Control Act as *"...an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses. (B) Facilities which serve these beneficial uses."*
35. "Pond" is defined as retention ponds, storage ponds, settling ponds, or any structures used for the treatment, storage, disposal, and recycling of process wastewater. Ponds are differentiated from sumps, which are structures in a conveyance system used for the installation and operation of a pump.
36. "Process wastewater" is defined as water directly or indirectly used in the operation of a milk cow dairy for any or all of the following: spillage or overflow from animal watering systems; washing, cleaning, or flushing pens, barns, manure pits, or other dairy facilities; washing or spray cooling of animals; or dust control...and includes any water or precipitation and precipitation runoff which comes into contact with any raw materials, products, or byproducts including manure, feed, milk, or bedding.
37. "Production area" is defined as that part of a milk cow dairy that includes the animal confinement area, the manure storage area, the raw materials storage area, and the waste containment areas.
38. "Regional Board" is defined as one of the nine California Regional Water Quality Control Boards.
39. "Salt" is defined as the products, other than water, of the reaction of an acid with a base. Salts commonly break up into cations (sodium, calcium, etc.) and anions (chloride, sulfate, etc.) when dissolved in water. Total dissolved solids is generally measured as an indication of the amount of salts in a water or wastewater.

40. "Salt in animal rations" is defined as the sodium chloride and any added minerals (such as calcium, phosphorus, potassium, sulfur, iron, selenium, copper, zinc, or manganese) in the animal ration.
41. "Significant quantity" is defined as the volume, concentrations, or mass of a pollutant that can cause or threaten to cause pollution, contamination, or nuisance; adversely impact human health or the environment; and/or cause or contribute to a violation of any applicable water quality standards for the receiving water.
42. "Sole-source aquifer" is defined as an aquifer that supplies 50 percent or more of the drinking water of an area.
43. "State" is defined as the State of California.
44. "State Water Board" is defined as the State Water Resources Control Board.
45. "Significant storm event" is defined as a precipitation event that results in continuous runoff of storm water for a minimum of one hour, or intermittent discharge of runoff for a minimum of three hours in a 12-hour period.
46. "Storm water" is defined as storm water runoff, snowmelt runoff, and surface runoff and drainage.
47. "Subsurface (tile) drainage" is defined as water generated by installing and operating drainage systems to lower the water table below irrigated lands. Subsurface drainage systems, deep open drainage ditches, or drainage wells can generate this drainage.
48. "Surface water" is defined as water that includes essentially all surface waters such as navigable waters and their tributaries, interstate waters and their tributaries, intrastate waters, all wetlands and all impoundments of these waters. Surface waters include irrigation and flood control channels.
49. "Tailwater" is defined as the runoff of irrigation water from an irrigated field.
50. "25-year, 24-hour rainfall event" is defined as a precipitation event with a probable recurrence interval of once in twenty five years as defined by the National Weather Service in Technical Paper No. 40, "Rainfall Frequency Atlas of the United States," May, 1961, or equivalent regional or State rainfall probability information developed from this source.
51. "Waste" is defined as set forth in Water Code Section 13050(d), and includes manure, leachate, process wastewater and any water, precipitation or rainfall

runoff that came into contact with raw materials, products, or byproducts such as manure, compost piles, feed, silage, milk, or bedding.

52. "Waters of the state" is defined in Section 13050 of the California Water Code as "*...any surface water or groundwater, including saline waters, within the boundaries of the state.*"
53. "Wet season" is defined as the period of time between 1 October and 31 May of each year.

ATTACHMENT F

Acronyms And Abbreviations For Existing Milk Cow Dairies

ASABE	American Society of Agricultural and Biological Engineers
Basin Plans	Water Quality Control Plans
BMPs	best management practices
BOD ₅	five-day biochemical oxygen demand
BPT	best practicable control technology currently available
BPTC	best practicable treatment or control
CCR	California Code of Regulations
CDQAP	California Dairy Quality Assurance Program
Central Valley Water Board	California Regional Water Quality Control Board, Central Valley Region
cm/sec	centimeters per second
CPS	Conservation Practice Standard
DWQ	Division of Water Quality
DWR	Department of Water Resources
EC	electrical conductivity
ESP	Environmental Stewardship Program
ET _o	Evapotranspiration from a standardized grass surface
GWPA	Groundwater Protection Area
MCL	maximum contaminant level
mg N/L	milligrams nitrogen per liter
mg/L	milligrams per liter
ml	milliliter
MPN	most probable number
MRP	Monitoring and Reporting Program
MWICR	monitoring well installation completion report
MWISP	monitoring well installation and sampling plan
NAD83	North American Datum 1983
NAVD88	North American Vertical Datum 1988
NMP	nutrient management plan
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
pH	Logarithm of the reciprocal of hydrogen ion concentration in gram atoms per liter
QA/QC	quality assurance/quality control
REC-1	water contact recreation
Region	Central Valley Region
Regional Board	California Regional Water Quality Control Board
ROWD	Report of Waste Discharge
SPRR	Standard Provisions and Reporting Requirements

State Water Board	State Water Resources Control Board
State Water Board Resolution 68-16	State Water Resources Control Board Resolution 68-16 (<i>Statement of Policy with Respect to Maintaining High Quality of Waters in California</i>)
State Water Board Resolution 88-63	State Water Resources Control Board Resolution 88-63 (<i>Sources of Drinking Water Policy</i>)
State Water Board Resolution 92-49	State Water Resources Control Board Resolution 92-49 (<i>Policies and Procedures for Investigation and Cleanup or Abatement of Discharges Under Water Code Section 13304 or Cleanup and Abatement Policy</i>)
TDS	total dissolved solids
Title 3	Title 3 of the California Code of Regulations, Division 2, Chapter 1, Article 22
Title 27	Title 27 of the California Code of Regulations, Division 2, Subdivision 1, Chapter 7, Subchapter 2, Article 1
UCCE	University of California Committee of Experts
U.N.	United Nations
$\mu\text{mhos/cm}$	micromhos per centimeter (same as $\mu\text{S/cm}$)
$\mu\text{S/cm}$	microsiemens per centimeter (same as $\mu\text{mhos/cm}$)
USEPA	United States Environmental Protection Agency
WDRs	waste discharge requirements
WMP	waste management plan