

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
ORDER R5-2013-0122

REISSUED WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
EXISTING MILK COW DAIRIES

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FOR
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The California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board or 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. This Order rescinds and replaces General Order R5-2007-0035 (the “2007 General Order”), which the Board originally issued on 3 May 2007.
2. This Order applies to owners and operators of existing milk cow dairies (hereinafter referred to as “Dischargers”) that:
 - (1) submitted a complete Report of Waste Discharge (ROWD) in response to the Central Valley Water Board’s 8 August 2005 request for such a report (the “2005 ROWD Request Letter”), and
 - (2) have not been expanded (“expansion” is defined in Attachment E) since 17 October 2005.

After the Board issued the 2007 General Order, the Board notified the Dischargers that they were required to comply with the terms and conditions of that Order. After the Board issues this Order, the Board will notify the Dischargers that were previously regulated by the 2007 General Order that they will now be 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 under a conditional waiver issued pursuant to Water Code section 13269.

REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

3. The Central Valley Water Board possesses the authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater. This authority is derived from the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code).
4. Water Code section 13260 requires that 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 that discharge with the Central Valley Water Board.

5. The Central Valley Water Board generally regulates waste discharges by prescribing waste discharge requirements, which must implement the relevant water quality control plan. The Central Valley Water Board may prescribe general waste discharge requirements for a category of discharges if all the following criteria apply:
 - 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 waste discharges, the Central Valley Water Board implements State laws and regulations. California regulations governing discharges from confined animal facilities are contained in the Title 27 of the California Code of Regulations (“Title 27”), at sections 22560 et seq.
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 ROWD in response to the 2005 ROWD Request Letter, and have not expanded (“expansion” is defined in Attachment E) since 17 October 2005.
8. Herd sizes at existing dairy operations vary as operators strive to maintain a consistent milk production. Maintaining consistent milk production requires a dairy operator to manage the herd by continually producing calves, some of which eventually replace the dairy’s producing herd over time, while excess stock are marketed for beef production or herd replacement elsewhere.
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 ROWD filed in response to the 2005 ROWD 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 ROWD filed in response to the 2005 ROWD Request Letter is considered an expansion.
12. There are approximately 1,300 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*, referred to hereafter as the *State Anti-Degradation Policy*), the sections of Title 27 related to 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 reissued Order as originally issued was intended to enhance requirements on existing milk cow dairies, and recognized that this would mean that many Dischargers would need to make improvements at their facilities to meet these requirements. Because this is a reissued Order, it is recognized that some of the necessary improvements have already occurred. Improvements 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.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

16. The Central Valley Water Board is the lead agency with respect to the issuance of this Order under applicable provisions of the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.).
17. In accordance with CEQA, the Central Valley Water Board adopted a Negative Declaration in 1982 concurrently 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 states that, “No environmental impact report may be required by any state agency for any activity of a dairy farm, including adoption of waste discharge requirements under Division 7 of the Water Code” 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.” (Cal. Code Regs., tit. 14, § 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 Board solicited permit applications (ROWDs) from existing dairies on 8 August 2005. These reports were due on 17 October 2005.

The information contained in the ROWDs submitted to the Board in 2005 presented Board staff with a description of the dairies as they existed at that date. The environmental baseline for the 2007 General Order therefore consisted 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 17 October 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. This Order, which supplements regulatory requirements already imposed on the existing dairy discharges under the 2007 General Order and which is designed to enhance the protection of groundwater resources, is exempt from the provisions of CEQA in accordance with the following categorical exemptions:
- a. California Code of Regulations, title 14, section 15301, which exempts the “operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features” from environmental review. Eligibility under the Dairy General Order is limited to milk cow dairies that were existing facilities as of 17 October 2005, and the Order does not authorize the expansion of these facilities. The 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. California Code of Regulations, title 14, section 15302, which exempts 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...” The Dairy General Order will likely require covered dairies to replace or reconstruct portions of their waste management systems to ensure compliance with the Order’s requirements.
 - c. California Code of Regulations, title 14, section 15304 exempts “... 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 Dairy General Order will require covered dairies to make improvements to their waste management systems that will result in only minor alterations to land, water, and/or vegetation.

DAIRY IMPACTS ON WATER QUALITY

21. Groundwater monitoring shows that many dairies in the Region have impacted groundwater quality. A University of California study of five dairies in a high-risk groundwater area in the Region during the 1990s found elevated salts and nitrates beneath the production area, wastewater retention ponds and land application areas. Data included in the first annual monitoring report of the Central Valley Dairy Representative Monitoring Program (CVDRMP) reported that groundwater beneath some dairies that have begun implementation of practices required by the 2007 General Order continue to have elevated levels of salts and nitrates beneath the production area, wastewater retention ponds and land application areas. Representative monitoring programs (RMP) began monitoring groundwater in 2012, and some provisions of the 2007 General Order were only fully implemented by 2012, therefore, monitoring results may not be fully reflective of the effectiveness of current practices. Prior to the issuance of the 2007 General

Order, 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 impacts under many of the dairies, including where groundwater is as deep as 120 feet and in areas underlain by fine-grained sediments.

22. Groundwater monitoring is the most direct way to determine if management practices at a dairy are protective of groundwater, Monitoring and Reporting Program R5-2013-0122 (MRP), 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.

23. Under the MRP, Dischargers have the option of either implementing individual groundwater monitoring or participating in a Representative Monitoring Program (RMP) to identify whether or not their specific management practices are resulting in adverse impacts to groundwater (i.e., whether the discharge is in compliance with the groundwater limitations of this Order). Extensive long-term monitoring is needed to document which dairy waste management practices are protective of groundwater, and what effect these management practices will have on groundwater under a variety of different site conditions.

a. Dischargers implementing individual monitoring must submit the following reports to the Board's Executive Officer:

Annual Reports: Dischargers who have elected to perform individual groundwater monitoring must submit annual groundwater monitoring reports to the Executive Officer. These annual reports provide a summary of the analytical data collected to date and an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided are representative of conditions upgradient and downgradient of the wastewater management area, production area, and land application area of the dairy facility.

Summary Report: In addition to submittal of annual reports, the MRP also requires that Dischargers conducting individual groundwater monitoring submit a summary report six (6) years after initiating sampling. The summary report must provide a detailed assessment of the monitoring data, and must include an evaluation of whether site activities associated with operation of the wastewater retention ponds, production area, or land application areas have impacted groundwater quality. The summary report must include a discussion on implementation of changes in management practices and/or activities that are being taken and an evaluation of progress in complying with Groundwater Limitation F.1 of the Order.

b. Dischargers participating in an RMP must collectively submit the following reports to the Board's Executive Officer:

Annual Representative Monitoring Reports: The RMP must submit Annual Representative Monitoring Reports (ARMR), which must describe the monitoring activities (including a tabulated summary of groundwater analytical data) conducted by the RMP, and which must identify the number and location of installed monitoring wells and other types of monitoring devices. Within each ARMAR, the RMP must evaluate the groundwater monitoring data to determine whether groundwater is being impacted by activities at facilities being monitored by the RMP. The submittal must include a description of the methods used in evaluating the groundwater monitoring data.

Summary Representative Monitoring Report: Six (6) years following submittal of the first ARMAR, the RMP must submit a Summary Representative Monitoring Report (SRMR) to the Board's Executive Officer. The SRMR is to identify management practices that are protective of groundwater quality for the range of conditions found at participating facilities. Based on information supplied in the SRMR, if management practices are found not to be protective of groundwater quality, the SRMR must propose solutions and upgrades that will result in compliance.

Individual Annual Monitoring Reports: Dischargers who have participated in the RMP must submit Annual Monitoring Reports following the Executive Officer's approval of the SRMR, which must document what they are doing to upgrade management practices that have been found not to be protective of groundwater. These reports are due every July 1 following Executive Officer approval of the SRMR. The first annual report must identify alternative management practices the Discharger intends to implement at its dairy facility along with a schedule for implementation. With each subsequent Annual Monitoring Report, the Discharger must provide an update on their implementation of additional or alternative management practices.

24. 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.
25. 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 all adverse impacts to waters of the state either because of their

outdated design or need for maintenance or both. Historic operation of these dairies has often resulted in adverse effects on the water quality. 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. This Order includes time schedules for compliance for dairy operators to implement improvements if groundwater data indicate that certain types of facilities/practices are not protective of groundwater quality.

STATE ANTI-DEGRADATION POLICY (RESOLUTION 68-16)

26. The State Anti-Degradation Policy prohibits the Central Valley Water Board from authorizing the degradation of high-quality groundwater unless it has been shown that:
 - a. The degradation is consistent with the maximum benefit to the people of the state.
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses.
 - c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives, and
 - d. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

27. This Order places restrictions on the discharge of wastes from dairy facilities that are intended to prevent pollution and nuisance conditions from occurring or persisting. Though the Board recognizes that degradation of high-quality groundwater will still occur pursuant to this Order, the implementation of nutrient management plans, waste management plans, enhanced management practices within the production area, and improved containment features for new and expanding dairy wastewater retention ponds will limit the amount of degradation that will occur under this Order. Degradation will be limited so that discharges from dairy facilities will not cause long-term impacts to beneficial uses. Where immediate compliance with water quality objectives cannot be achieved, this Order includes a time schedule for compliance for the implementation or modification of waste management practices.

28. Consistent with the *State Anti-Degradation Policy*, this Order establishes requirements and standards that will result in the implementation of BPTC measures to limit the degradation caused by dairy discharges. The following is a general description of what the Board considers to be BPTC for specified areas of a dairy operation:

- a. Production Areas (including milk barns, wash/sprinkler pens, feed and non-liquid manure storage areas, and corrals): surface water discharges from the production area are prohibited, and the production areas shall be managed to limit the extent to which wastewater can infiltrate into the underlying materials.
 - b. Land Application Areas: Dischargers must prepare and implement Nutrient Management Plans (NMPs). Discharges from the land application areas must not cause or contribute to an exceedance of any applicable water quality objective or federal water quality criteria.
 - c. Existing Wastewater Retention Ponds: Existing wastewater retention ponds must be in compliance with design standards specified in Title 27. However, these design standards have not been found to be protective of groundwater under all conditions, and the immediate replacement of these wastewater retention ponds is not a practicable option for many dairies. Therefore, though compliance with Title 27 design standards was once considered to be BPTC, the Board now considers BPTC for existing ponds to be an iterative process whereby the ponds are evaluated (either under an individual monitoring program or under the RMP) to determine whether or not they are protective of the underlying groundwater, and upgraded or replaced on a time schedule that is as short as practicable if they are found not to be protective. This Order contains a time schedule to bring any deficient management practices (including wastewater retention ponds) into compliance.
 - d. New and Expanded Wastewater Retention Ponds: This Order establishes requirements for new and expanded wastewater retention ponds that are more stringent than the requirements in Title 27 in order to provide groundwater protection. New and expanded wastewater retention ponds must meet a strict performance standard that only allows for a very conservative pond design unless there has been a demonstration that an alternative design meets the strict performance standard.
29. This Order also contains closure requirements that specify that 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.
 30. This Order will assure that pollution or nuisance will not occur outside of the time schedule for improvements set by this Order. This Order addresses impacts from future discharges of waste, but does not address the cleanup of surface and groundwater that has been polluted due to historic dairy operations. Any required cleanup would be handled under separate authority under the Water Code.
 31. The Central Valley Water Board recognizes that there is often site-specific, crop-specific, and regional variability which affects the selection of appropriate

management measures, as well as the design constraints and pollution control effectiveness of various practices. In compliance with Water Code section 13360, dairy owners/operators have the flexibility to choose management practices that best achieve a management measure's performance expectations given their own unique circumstances. It is expected that this will be an iterative process whereby the effectiveness of any set of practices in minimizing degradation will be periodically reevaluated as necessary for and/or as more recent and detailed water quality data become available.

32. To assess compliance with the *State Anti-Degradation Policy*, this Order requires Dischargers to monitor discharges to surface waters and groundwater. The requirements to monitor first encountered groundwater (the point in the aquifer where typically detection of changes to groundwater quality, caused by the facility, would be first detected) are met when the Dischargers perform individual groundwater monitoring or participate in an RMP. The purpose of monitoring is to confirm that the discharges are effectively controlled by management practices and to evaluate compliance with this Order.
33. When the Board prescribes waste discharge requirements that will result in the degradation of high-quality waters, the *State Anti-Degradation Policy* requires that the Board first make a determination that the authorized degradation is consistent with the maximum benefit to the people of the State. Consistent with the evaluation contained in the Information Sheet and considering the economic significance of the Central Valley dairy industry and the important role Central Valley dairies play in providing adequate milk supplies to the nation, the Central Valley Water Board finds that maintaining the Central Valley dairy industry is consistent with the maximum benefit to the people of the state. To maintain the industry and to prevent the loss of jobs and the impacts to the local economy that might otherwise occur, some degradation to high quality waters must be allowed. However, this degradation will be limited by this Order so that there will not be long-term impacts to beneficial uses, thereby allowing the full utilization of the aquifer.

ENVIRONMENTAL STEWARDSHIP PROGRAMS

34. 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. 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.

35. 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

36. This Order does not authorize violation of any federal, state, or local law or regulation.
37. As stated in 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.
38. In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
39. 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.
40. 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.
41. In 2006, the Central Valley Water Board, the State Water Board, and Regional stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. The CV-SALTS effort might effect changes to the Basin Plans that would necessitate the re-opening of this Order.
42. The Central Valley Water Board recognizes that the 2007 General Order imposed new and more stringent requirements on existing milk cow dairies. This Order is

intended to enhance the requirements imposed under the 2007 General Order. However, some revisions to this Order may be necessary in the future 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.

43. 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.
44. 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.

IT IS HEREBY ORDERED that, pursuant to 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 were formerly regulated under the original version of Order R5-2007-0035 adopted in May 2007, their agents, successors, and assigns shall comply with the following:

A. PROHIBITIONS

1. The discharge of hazardous wastes, as that term is defined in California Code of Regulations, title 22, section 66261.1 *et seq.*, is prohibited.
2. Except when authorized by a National Pollutant Discharge Elimination System (NPDES) permit, the direct or indirect discharge of waste and/or storm water from the production area to surface waters is prohibited¹.
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 prohibited.
4. The collection, treatment, storage, discharge or disposal of wastes at an existing milk cow dairy shall not result in the creation of a condition of pollution or nuisance².

¹ 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.

² Except in circumstances where a Discharger is making improvements to waste management practices that have

5. The disposal of waste not generated by on-site animal production activities is prohibited except where a ROWD for the disposal has been submitted to the Executive Officer and the Central Valley Water Board has issued or waived WDRs for that discharge.
6. The disposal of dead animals in any liquid manure or wastewater retention ponds 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 animals³.
7. All animals shall be prohibited from entering any surface water within the animal confinement area. (Title 27, § 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.
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.

been found not to be protective of the underlying groundwater under a time schedule that is as short as practicable.

³ In an emergency, guidance is provided by the Conditional Waiver of Waste Discharge Requirements for Disaster-Related Wastes during a State of Emergency within the Central Valley Order 2013-0026.

15. Under this General Order, the expansion of the existing milk cow dairy beyond the level as defined under the term “Expansion” is prohibited⁴.

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, wastewater retention 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 that were built or expanded after 27 November 1984 shall be protected against 100-year peak stream flows. (Title 27, §22562(c).)
3. In the Tulare Lake Basin, existing milk cow dairies in operation on or before 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 that were expanded after 8 December 1984 shall be protected from 100-year peak stream flows.
4. Dischargers who are subject to this Order shall implement water quality management practices, as necessary, to protect water quality and to achieve compliance with applicable water quality objectives on a schedule that is as short as practicable as described in the Time Schedule for Compliance (section M of this Order). The proposed time schedule must be supported with appropriate technical or economic justification as to why the proposed schedule is as short as practicable.
5. If groundwater monitoring demonstrates that discharge(s) from a dairy have caused an exceedance of the groundwater limitations set forth in this Order,

⁴ Dischargers must submit a ROWD, document compliance with CEQA, and obtain coverage under individual waste discharge requirements before any material facility expansion. “Expansion” is defined in Attachment E.

- the Executive Officer may issue an order to the owner/operator of the monitored dairy to identify and implement management practices that are protective of groundwater quality on a schedule that is as short as practicable.
6. 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, § 22562(b).)
 7. 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.

C. POND SPECIFICATIONS

1. The level of waste in the process wastewater retention ponds (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 registered in California, 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.
2. 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.
3. 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.

4. Existing Ponds⁵

- a. Dischargers conducting groundwater monitoring pursuant to an Individual Monitoring Program shall maintain and operate existing ponds in such a manner so as to constitute best practical treatment or control (BPTC) or best efforts for existing ponds, which is further discussed in the Information Sheet at page 10 (Best Practicable Treatment or Control Measures for Existing Dairy Ponds). Such operations shall be maintained throughout the development of the Summary Report that is required by Monitoring and Reporting Program R5-2013-0122, Attachment A, Section II.12. The Summary Report is due within six years of initiating individual groundwater sampling activities or at an earlier date if required by the Executive Officer.

If the monitoring data in the Summary Report indicate that Groundwater Limitation F.1 of this Order is violated, Dischargers are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that are not high quality) that will bring the facility into compliance with Groundwater Limitation F.1 on a time schedule that is as short as practicable.

- b. Dischargers enrolled under the Representative Monitoring Program (RMP) shall maintain and operate existing ponds in such a manner so as to constitute best practical treatment or control or best efforts as (defined/discussed) in the Information Sheet throughout the development of the Summary Representative Monitoring Report (SRMR), which is due to the Central Valley Water Board on 1 April 2019.
- c. Dischargers enrolled under the RMP shall implement the recommended management practices that are applicable to Existing Ponds in accordance with the SRMR and its schedule as approved by the Central Valley Water Board Executive Officer.

If the SRMR indicates that the Dischargers Existing Ponds may have discharges that violate Groundwater Limitation F.1, of this Order or that such discharges from Existing Ponds may cause degradation to high quality waters, Dischargers are required to implement the approved SRMR's identified management practices/activities for Existing Ponds

⁵ Existing Ponds are defined to mean those ponds in operation as of 3 May 2007 when the Board issued the 2007 General Order and are not new ponds that are designed to meet the Tier 1 or Tier 2 requirements set forth in Provision C.5 of this Order.

that will bring the facility into compliance with Groundwater Limitation F.1. Such practices are considered to constitute best practical treatment or control or best efforts and are designed to achieve compliance with Groundwater Limitation F.1 on a time schedule that is as short as practicable.

5. New and Reconstructed Ponds

- a. 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.
- b. New and reconstructed pond designs 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:
 - i. 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.
 - ii. 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 Pond Specification 5. C. below.
- c. Prior to the enlargement of an existing pond (settling, storage, or retention) or the construction of any such new pond not associated with an expansion, the Discharger shall submit to the Executive Officer:
 - i. For Tier 1 and 2 pond designs, 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:

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 this Order,
 4. 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
 5. An operations and maintenance plan for the pond.
- ii. 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.

- d. Prior to the placement of waste in any enlarged existing 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 Pond Specification C.5.b 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.

D. PRODUCTION AREA SPECIFICATIONS

The Production area includes, but is not limited to, barns, milk houses, corrals, milk parlors, manure and feed storage areas, process water conveyances and any other area of the dairy facility that is not the land application area or the ponds.

1. All dirt or unpaved corrals shall be graded to promote drainage. Cow washing areas shall be paved (concrete or equivalent) and sloped to a drain. Water troughs, permanent feed racks, and mangers shall have paved access, and water troughs shall have a drain to carry water away from the corrals. (Cal Code Regs., title 3, § 646.1.)
2. All milk rooms and milk barns shall be floored with concrete or other low permeability suitable material and be properly drained. (Cal Code Regs., title 3, §§ 648(c) & 649(a).) All drainage that comes in contact with waste (as defined in Finding 13) shall be directed to the wastewater retention ponds.
3. All drainage that has contacted feed is a waste in accordance with Finding 13 and shall be directed to the wastewater retention ponds.
4. 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 ponds. (Title 27, § 22562(b).)
5. Roof drainage from barns, milk houses, or shelters shall not drain into the corrals unless the corrals are properly graded and drained. (Cal Code Regs., title 3, § 661.)
6. The 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 ponds and to minimize standing water as of 72 hours after the last rainfall and the infiltration of water into the underlying soils.
7. For Dischargers conducting individual groundwater monitoring, if the monitoring data in the Summary Report indicate that the Dischargers Production Area may have discharges that violate Groundwater Limitation F.1 of this Order or that such discharges may cause degradation to high quality waters, the Dischargers are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that

are not high quality) that will bring the facility into compliance with Groundwater Limitation F.1 on a time schedule that is as short as practicable.

8. Dischargers enrolled under the RMP shall implement the recommended management practices that are applicable to Production Areas in accordance with the SRMR and its approved time schedule.

If the SRMR indicates that the Dischargers Production Area may have discharges that violate Groundwater Limitation F.1 of this Order or that such discharges may cause degradation to high quality waters, the Dischargers are required to implement the approved SRMR's identified management practices/activities for Production Areas that will bring the facility into compliance with Groundwater Limitation F.1. Such practices are considered to constitute best practical treatment or control or best efforts and are designed to achieve compliance with Groundwater Limitation F.1 on a time schedule that is as short as practicable.

E. LAND APPLICATION SPECIFICATIONS

1. 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.
2. 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 J.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.
3. 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.
4. 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.
5. 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 J.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 R5-2013-0122.

6. 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.
7. 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.
8. All process wastewater applied to land application areas must infiltrate completely within 72 hours after application.
9. 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).
10. If the monitoring data in the Summary Report indicate that the Dischargers Land Application Area may have discharges that violate Groundwater Limitation F.1 of this Order, or that such discharges may cause degradation to high quality waters, the Dischargers are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that are not high quality) that will bring the facility into compliance with Groundwater Limitation F.1 on a time schedule that is as short as practicable.
11. Dischargers enrolled under the RMP shall implement the recommended management practices that are applicable to Land Application Areas in accordance with the SRMR and its approved time schedule.

If the SRMR indicates that the Dischargers Land Application Areas may have discharges that violate Groundwater Limitation F.1 of this Order or that such discharges from Land Application Areas may cause degradation to high quality waters, Dischargers are required to implement the approved SRMR's identified management practices/activities for Land Application Areas that will bring the facility into compliance with Groundwater Limitation F.1. Such practices are considered to constitute best practical treatment or control or best efforts and are designed to achieve compliance with Groundwater Limitation F.1 on a time schedule that is as short as practicable.

F. GROUNDWATER LIMITATIONS⁶

1. Discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.⁷ 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.).

G. PROVISIONS

1. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements General Order R5-2013-0122 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, and the applicable Water Quality Control Plans.
3. The Discharger shall comply with the attached Monitoring and Reporting Program R5-2013-0122 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 ROWD in accordance with the 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 Assessment⁸ indicates that facility improvements are necessary (see Required Reports and Notices J.1.d), the Discharger shall make continual facility improvements while completing implementation of the Waste Management Plan and/or Nutrient Management Plan.

⁶ These limitations are effective immediately except where Dischargers are in compliance with Provision M of this Order and the requirements of Sections II or III of the Monitoring and Reporting Program R5-2013-0122, Attachment A, and such Dischargers are implementing management practices/activities on a time schedule that is as short as practicable. For Dischargers participating in the RMP, the implementation of management practices/activities must be implemented on a time schedule that is as short as practicable and that is consistent with any time schedule or schedule that is included in the SRMR that is approved by the Executive Officer.

⁷ Except in circumstances where a Discharger is making improvements to waste management practices that have been found not to be protective of the underlying groundwater under a time schedule that is as short as practicable.

⁸ The Preliminary Dairy Facility Assessment is required as part of the Existing Conditions Report (Attachment A).

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 ROWD 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 R5-2013-0122. Alterations of the Waste Management Plan (see Required Reports and Notices J.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 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 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 L.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.

H. 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.

I. 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. This includes regulatory changes that may be brought about by the CV-SALTS planning efforts.
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 ROWD and obtain individual waste discharge requirements.

J. REQUIRED REPORTS AND NOTICES

1. Dischargers must submit the following in accordance with the Schedule of Tasks L.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 ROWD submitted in response to the 2005 ROWD Request Letter. 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.
 - 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, General Specifications B.1-B.3, Pond Specifications C.1 through C.3, and Production Area Specifications D.1, D.4, and D.5. If the design, construction, operation, and/or maintenance of the dairy facility do 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 L.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 L.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 J.1.a above) shows that the Whole Farm Nitrogen Balance⁹ 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.
2. Reporting Provisions:
- a. All ROWDs, 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 R5-2013-0122.
 - 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

⁹ 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).

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.

K. 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 R5-2013-0122.

L. SCHEDULE OF TASKS

1. Dischargers are required to develop and implement a Waste Management Plan and Nutrient Management Plan, submit an Existing Conditions Report, a Salinity Report, a Proposed Interim Facility Modifications, a 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 J.2.a above and the additional professional specified in Table 1.

Dischargers must submit a statement of completion to the Executive Officer for each of the elements of the Nutrient Management Plan by the deadlines specified in Table 1. All statements must be signed and certified by the Discharger as required in Required Reports and Notices J.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.

M. Time Schedule for Compliance

Dischargers conducting an Individual Monitoring Program shall submit a summary report within six (6) years of initiating sampling activities. The summary report must include identification of management practices that need to be implemented

to achieve compliance with applicable water quality objectives, including the groundwater limitations of the Order. Required Annual Reports presented after the submittal of the summary report, must include a discussion on implementation of changes in management practices and/or activities that are being taken and an evaluation of progress in complying with the Groundwater Limitations F.1. of the Order. Implementation of the identified management practices must be as soon as practicable, supported with appropriate technical or economic justification and in no case may time schedules extend beyond 10 years from the date that the summary report is approved by the Executive Officer.

For Dischargers participating in a representative monitoring program that is required to submit a Summary Representative Monitoring Report (SRMR) (See Monitoring and Reporting Program R5-2013-0122, Provision III.10), the following time schedule shall apply to allow Dischargers sufficient time to implement identified management practices to achieve compliance with Groundwater Limitations described in Section F.1. of this Order. The Central Valley Water Board may modify these schedules based on evidence that meeting the compliance date is technically or economically infeasible, or when evidence shows that compliance by an earlier date is feasible. Any applicable time schedules for compliance established in the Basin Plans supersede the schedules given below (e.g., time schedules for compliance with salinity standards that may be established in future Basin Plan amendments through the CV-SALTS process).

- a. The SRMR must be submitted no later than six (6) years following submittal of the first Annual Representative Monitoring Report (ARMR) (e.g., the CVDRMP submitted its first ARMR on April 1, 2013, thus the CVDRMP's SRMR must be submitted by April 1, 2019).
- b. The SRMR must identify management practices that are protective of groundwater quality for the range of conditions found at facilities participating in the representative monitoring program, and must identify in the SRMR time schedules that are as short as practicable for implementation of the identified management practices. Within 18 months of submittal of the SRMR and no later than July 1, 2020, all member dairies of the RMP for which the SRMR was submitted must submit a letter of intent to comply with applicable management practices identified in the SRMR. Time schedules in the SRMR for implementation of the identified management practices must be as soon as practicable, supported with appropriate technical or economic justification and in no case may time schedules beyond 10 years from the date that the SRMR is approved by the Executive Officer.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in

the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

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 October 2013.

Original signed by

PAMELA C. CREEDON, Executive Officer

Reissued Waste Discharge Requirements General Order No. R5-2013-0122
Existing Milk Cow Dairies

Table 1. Schedule for Submittal of Existing Conditions Report, Waste Management Plan, Nutrient Management Plan, Salinity Report, Preliminary Infrastructure Needs Checklist, and Annual Reports

Due Date	Submittal Due	Contents of Submittal	Professional Certification Requirements
31 December 2007	Existing Conditions Report (Attachment A)	Preliminary Dairy Facility Assessment, maps, etc.	None
1 July 2008	Annual Report	Per Monitoring and Reporting Program No.R5-2013-0122, including Annual Dairy Facility Assessment with proposed interim facility modifications considered to be implemented.	None
1 July 2008	Statement of Completion of the Following Items in Attachment C (Nutrient Management Plan):*		
	Items I.A.1, I.B, I.C, I.D	Land Application Area Information.	None
	Item II	Sampling and Analysis Plan.	Certified Nutrient Management Specialist
	Item IV	Setbacks, Buffers, and Other Alternatives to Protect Surface Water.	None
1 July 2008	Item VI	Record-Keeping Requirements.	None
	The following items in Attachment B (Waste Management Plan):		
	Items I.A, I.B, I.C, I.D, I.E, I.F.1a, I.F.2a, I.F.3, I.F.4, I.F.5	Facility Description.	None
	Item V	Operation and Maintenance Plan.	None

Reissued Waste Discharge Requirements General Order No. R5-2013-0122
Existing Milk Cow Dairies

Table 1. Schedule for Submittal of Existing Conditions Report, Waste Management Plan, Nutrient Management Plan, Salinity Report, Preliminary Infrastructure Needs Checklist, and Annual Reports

Due Date	Submittal Due	Contents of Submittal	Professional Certification Requirements
1 July 2008	Identification of Backflow Problems	Identify backflow problems with proposed remediation and schedule.	Trained Professional**
	Proposed Interim Facility Modifications as Necessary to Improve Storage Capacity	Proposed interim facility modifications (e.g., recycling flush water, diverting roof runoff, resizing nozzles, removing pond solids, etc.) that can be completed within the next 12 months to decrease storage capacity needs or increase existing storage capacity, with schedule to implement proposed modifications within 12 months.	None
	Proposed Interim Facility Modifications as Necessary to Balance Nitrogen	Proposed interim facility modifications (e.g., acquiring more cropland, exporting more wastes, reducing herd size, etc.) that can be completed within 12 months to balance the nitrogen generated and imported with the nitrogen removed by crops and exported, with schedule to implement proposed modifications within 12 months.	None
31 December 2008	Statement of Completion of Item V of Attachment C (Nutrient Management Plan)*	Field Risk Assessment – Evaluate the effectiveness of management practices to control waste discharges from land application areas.	None
	Preliminary Infrastructure Needs Checklist	Identification of infrastructure changes needed to properly manage wastes (e.g., piping, pumps, meters, etc.).	None

Reissued Waste Discharge Requirements General Order No. R5-2013-0122
Existing Milk Cow Dairies

Table 1. Schedule for Submittal of Existing Conditions Report, Waste Management Plan, Nutrient Management Plan, Salinity Report, Preliminary Infrastructure Needs Checklist, and Annual Reports

Due Date	Submittal Due	Contents of Submittal	Professional Certification Requirements
1 July 2009	Annual Report	Per Monitoring and Reporting Program No. R5-2013-0122 including Annual Dairy Facility Assessment with modifications implemented to date.	None
1 July 2009	Documentation of Interim Facility Modifications Completion for Storage Capacity and to Balance Nitrogen	Document all interim modifications completed and identify those that were proposed but not completed.	None
1 July 2009	Nutrient Management Plan Retrofitting Plan with Schedule	Retrofitting needed to improve nitrogen balance (may include piping, meters, pumps, etc.).	None
	Statement of Completion of the Following Items in Attachment C (Nutrient Management Plan)*: Item I.A.2 Item III	Land Application Area Information Nutrient Budget	None Certified Nutrient Management Specialist
1 July 2009	Waste Management Plan (with Retrofitting Plan/Schedule) Including the Following Items in Attachment B (Waste Management Plan):	Retrofitting needed to improve storage capacity, flood protection, or design of production area- may include design/construction of new pond, berms for flood protection, grading for drainage, etc.	California Registered Professional
	Items I.F.1.b, I.F.2.b	Facility Description	None

Reissued Waste Discharge Requirements General Order No. R5-2013-0122
Existing Milk Cow Dairies

Table 1. Schedule for Submittal of Existing Conditions Report, Waste Management Plan, Nutrient Management Plan, Salinity Report, Preliminary Infrastructure Needs Checklist, and Annual Reports

Due Date	Submittal Due	Contents of Submittal	Professional Certification Requirements
1 July 2009	Item II	Storage Capacity	California Registered Professional
	Item III	Flood Protection	California Registered Professional***
	Item IV	Production Area Design/Construction	None
	Item VI	Documentation there are no cross connections.	Trained Professional**
1 July 2009	Salinity Report	Identification of salt sources at dairy, evaluation of measures to minimize salt in the dairy waste, and commitment to implement measures identified to minimize salt in the dairy waste.	None
1 July 2010	Annual Report	Per Monitoring and Reporting Program No. R5-2013-0122 including Annual Dairy Facility Assessment with facility modifications implemented to date.	None
1 July 2010	Status on facility retrofitting completed or in progress	Status on facility retrofitting completion as proposed (1 July 2009) for the Nutrient Management Plan and Waste Management Plan.	None
1 July 2011	Annual Report	Per Monitoring and Reporting Program No. R5-2013-0122 including Annual Dairy Facility Assessment with facility modifications implemented to date.	None

Reissued Waste Discharge Requirements General Order No. R5-2013-0122
Existing Milk Cow Dairies

Table 1. Schedule for Submittal of Existing Conditions Report, Waste Management Plan, Nutrient Management Plan, Salinity Report, Preliminary Infrastructure Needs Checklist, and Annual Reports

Due Date	Submittal Due	Contents of Submittal	Professional Certification Requirements
1 July 2011	Certification of Facility Retrofitting Completion For Nutrient Management Plan	Certify completion of retrofitting proposed (1 July 2009) to improve nitrogen balance.	Certified Nutrient Management Specialist
	The Following Items in Attachment B (Waste Management Plan): Item II.C	Certification of completion of modifications made to meet storage capacity requirements.	California Registered Professional
1 July 2011	Item III.D	Certification of completion of modifications made to meet flood protection requirements.	California Registered Professional
	Item IV.C	Certification of modifications made to meet construction criteria for corrals, pens, animal housing area, and manure and feed storage areas.	None
1 July 2012	Annual Report	Per Monitoring and Reporting Program No. R5-2013-0122 including Annual Dairy Facility Assessment with facility modifications implemented to date.	None
1 July 2012	Certification of Nutrient Management Plan implementation	Certification that the Nutrient Management Plan has been completely implemented.	None

* The Discharger must certify in a statement that these items have been completed and certified by the appropriate professional as specified. These items are to be maintained at the dairy, made available to Central Valley Water Board staff during their inspections of the dairy, and submitted to the Executive Officer when requested by the Executive Officer.

** A trained professional could be a person certified by the American Backflow Prevention Association, an inspector for a state or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training.

*** A California Registered Professional is not required to demonstrate the facility has adequate flood protection if the Discharger provides a published flood zone map that shows the facility is outside of the relevant flood zone (see item III of Attachment B).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2013-0122

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 California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) or 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 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.

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 Central Valley Water 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. If monitoring consistently shows no significant variation of a constituent concentration or parameter, the Discharger may request the MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

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

A. MONITORING REQUIREMENTS

Visual Inspections

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 30 April) and monthly between 1 May 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 height of wastewater relative to the depth marker and 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>Prior to each wastewater application:</u> Inspect the land application area and note the condition of land application berms including rodent holes, piping, and bank erosion. Verify that any field valves are correctly set to preclude off-property or accidental discharges of wastewater.</p> <p><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>

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.

Nutrient Monitoring

The Discharger shall monitor 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.

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), un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium, and total dissolved solids.

Once every two years (biennially):

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

Annually

Laboratory analyses of liquid process wastewater, prior to blending with irrigation water, for pH, total dissolved solids, electrical conductivity, nitrate-nitrogen, ammonium-nitrogen, total Kjeldahl nitrogen, total phosphorus, and total potassium.

Manure

Once every two years (biennially):

Laboratory analyses for general minerals (calcium, magnesium, sodium, sulfur, chloride) and fixed solids (ash).

Twice per year:

Laboratory analyses for total nitrogen, total phosphorus, total potassium, and percent moisture.

Each application to each land application area:

Record the percent moisture and total weight (tons) applied.

Each offsite export of manure:

Record the percent moisture and total weight (tons) exported.

Laboratory analyses for percent moisture.

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 percent moisture and total weight (tons) of harvested material removed from each land application area.

Laboratory analyses for total nitrogen, total phosphorus, total potassium (expressed on a dry weight basis), fixed solids (ash), and percent moisture.

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 of Order No. R5-2013-0122 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

Soil

Once every 5 years from each land application area (may be distributed over a 5-year period by sampling 20% of the land application areas annually):

Laboratory analyses for soluble phosphorus

The following soil tests are recommended but not required:

Spring pre-plant for each crop:

Laboratory analyses for:

0 to 1 foot depth: Nitrate-nitrogen and organic matter.

1 to 2 feet depth: Nitrate-nitrogen.

Fall pre-plant for each crop:

Laboratory analyses at depths below ground surface of:

0 to 1 foot: Electrical conductivity, nitrate-nitrogen, soluble phosphorus, potassium and organic matter.

1 to 2 feet: Nitrate-nitrogen.

Irrigation Water¹

Each irrigation event for each land application area:

Record volume (gallons or acre-inches)² and source (well or canal) of irrigation water applied and dates applied.

One irrigation event during each irrigation season during actual irrigation events:

For each irrigation water source (well and canal):

Electrical conductivity, total dissolved solids, and total nitrogen.³

Data collected to satisfy the groundwater monitoring requirements (below) can be used to satisfy this requirement.

¹ The Discharger shall monitor irrigation water (from each water well source and canal) that is used on all land application areas.

² Initial volume measurements may be the total volume for all land application areas.

³ In lieu of sampling the irrigation water, the Discharger may provide equivalent data from the local irrigation district.

Monitoring of Surface Runoff

The Discharger shall monitor any 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 frequencies specified in Table 3 below.

Table 3. DISCHARGE MONITORING

Discharges (Including Off-Property Discharges) of Manure or Process Wastewater, from the Production Area or Land Application Area

Daily during each discharge:

Record date, time, approximate volume (gallons) or weight (tons), duration, location, source, and ultimate destination of the discharge.

Field measurements of the discharge for electrical conductivity, temperature, and pH.

Table 3. DISCHARGE MONITORING
<p>Laboratory analyses of the discharge for nitrate-nitrogen, total ammonia-nitrogen, un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, potassium, total dissolved solids, BOD₅¹, total suspended solids, and total and fecal coliform.</p> <p><u>Daily during each discharge to surface water:</u> For surface water upstream² and downstream³ of the discharge: Field measurements for electrical conductivity, temperature, dissolved oxygen, and pH.</p> <p>Laboratory analyses for nitrate-nitrogen, total ammonia-nitrogen, un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, potassium, total dissolved solids, total suspended solids, and total and fecal coliform.</p>
<p><i>Storm Water Discharges to Surface Water from the Production Area⁴</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, dissolved oxygen, 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 Area⁴</i> <u>First storm event of the wet season⁵ and during the peak storm season (typically February)⁶ each year from one third of the land application areas⁷ with the land application areas sampled rotated each year⁸:</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 un-ionized ammonia-nitrogen.</p> <p>Laboratory analyses of the discharge for nitrate-nitrogen, total phosphorus, turbidity, and total and fecal coliform.</p>
<p><i>Tailwater Discharges to Surface Water from Land Application Areas⁹</i> <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.</p> <p>Field measurements of discharge for electrical conductivity, temperature, pH, total ammonia-nitrogen, and un-ionized ammonia-nitrogen.</p> <p><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.</p>

¹ Five-day biochemical oxygen demand.

² Upstream samples shall be taken just far enough upstream so as not to be influenced by the discharge.

³ 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.

- ⁴ Sample locations must be chosen such that the samples are representative of the quality and quantity of storm water discharged.
- ⁵ 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.
- ⁶ 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.
- ⁷ 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.
- ⁸ 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 section below).
- ⁹ Tailwater samples shall be collected at the point of discharge to surface water.
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 the 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.

Groundwater Monitoring

The Discharger shall sample each domestic and agricultural supply well and subsurface (tile) drainage systems 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. The frequency of monitoring the domestic and agricultural supply wells for ammonium nitrogen and total dissolved solids may be reduced to every five years after two years of data are provided to the Executive Officer.

Table 4. GROUNDWATER MONITORING
<p><i>Domestic and Agricultural Supply Wells</i></p> <p><u>Annually:</u> Field measurements of electrical conductivity and ammonium nitrogen¹. Laboratory analyses of nitrate-nitrogen.</p> <p><u>Every five years (may be distributed over a 5-year period by sampling 20% of the wells annually):</u> Laboratory analyses for general minerals (calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, chloride, and total dissolved solids).</p> <p><i>Subsurface (Tile) Drainage System</i></p> <p><u>Annually:</u> Field measurements of electrical conductivity and ammonium nitrogen¹. Laboratory analyses of nitrate-nitrogen, total phosphorus, and total dissolved solids.</p>

¹ If field measurement indicates the presence of ammonium nitrogen, the discharger shall collect a sample for laboratory analysis of ammonium nitrogen.

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. If the sample cannot be collected prior to a pressure tank, the well must be purged at least twice the volume of the pressure tank. 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.
2. Additional groundwater monitoring requirements are specified in Attachment A to this Order.

General Monitoring Requirements

1. The Discharger shall comply with the additional groundwater monitoring requirements specified in Attachment A to this Order either through individual groundwater monitoring or by participation in a Representative Monitoring Program as laid out in Attachment.
2. The Discharger shall comply with all the "Requirements Specifically for Monitoring Programs and Monitoring Reports" as specified in the Standard Provisions and Reporting Requirements.

3. 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.
4. 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.
5. All samples collected shall be representative of the volume and nature of the material being sampled.
6. All sample 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.
7. 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.
8. All samples submitted to a laboratory for analyses shall be identified in a properly completed and signed Chain of Custody form.
9. Field test instruments used for temperature, pH, electrical conductivity, ammonia nitrogen, un-ionized ammonia nitrogen, 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 (Owners must maintain their own copies of this information):

1. All information necessary to document implementation and management of the Nutrient Management Plan, including the information described in Items 2 through 6 below;
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 or bypass of the wastewater storage or conveyance structures;
 - 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 of manure applied to each field;
 - d. Dates, locations, and volume of process wastewater applied to each field;
 - e. Whether precipitation occurred, or standing water was present, at the time of manure and process wastewater applications and for 24 hours prior to and following applications;
 - f. Dates, locations, and test methods for soil, manure, process wastewater, irrigation water, and plant tissue sampling;

- g. Results from manure, process wastewater, irrigation water, soil, plant tissue, discharge (including tailwater), and storm water sampling;
 - h. 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 of Order No. R5-2013-0122);
 - i. Calculations showing the total nitrogen, total phosphorus, and potassium to be applied to each field, including sources other than manure or process wastewater (Nutrient Budget);
 - j. Total amount of nitrogen, phosphorus, and potassium actually applied to each field, including documentation of calculations for the total amount applied (Nutrient Application Calculations);
 - k. The method(s) used to apply manure and/or process wastewater;
 - l. 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
 - m. 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 Nutrient Management Plan;
 5. Tracking Manifest forms (Attachment D of Order No. R5-2013-0122) for off-site exports of manure or process wastewater 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 through A.5 and A.8 through 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 Emergency Management Agency (CalEMA). 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. CalEMA 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 *Discharges (Including Off-Property Discharges) of Manure or Process Wastewater or Other Dairy Waste 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**. 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. Maximum and average number and type of animals, whether in open confinement or housed under roof during the reporting period;
3. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) generated by the facility during the annual reporting period; a calculation of the total nitrogen, total phosphorus, total potassium, and total salt content measured as fixed solids of the solid waste; and total dissolved solids of the liquid waste;
4. 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 total nitrogen, total phosphorus, total potassium, and total salt content measured as fixed solids (ash) of the solid waste and total dissolved solids of the liquid waste;
5. Quantify the ratio of total nitrogen applied to land application areas and total nitrogen removed by crop harvest (nitrogen uptake).
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; a calculation of the total nitrogen, total phosphorus, total potassium, and total salt content measured as fixed solids of the solid waste; and total dissolved solids of the liquid waste;
7. Total number of acres and the Assessor Parcel Numbers for all land application areas that were not used for application of manure or process wastewater during the reporting period;

8. Total number of acres and the Assessor Parcel Numbers of properties 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, and 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, and location; 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, and 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 Nutrient Management Plan has been updated and whether the current version of the facility's Nutrient Management Plan was developed or approved by a certified nutrient management specialist as specified in Attachment C of Order No. R5-2013-0122;
13. Copies of all manure/process wastewater tracking manifests for the reporting period;
14. A statement indicating if there were any changes to third party agreements to receive manure or process wastewater. If there were any changes, submit copies of all new or revised 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 (QA/QC) 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;

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.j, and B.3.l 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 QA/QC results).
2. Dischargers that have monitoring well systems shall include all laboratory analyses (including Chain of Custody forms and laboratory QA/QC 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 Order No. R5-2013-0122.

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 QA/QC 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 of Order No. R5-2013-0122, 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

3 October 2013

**MONITORING AND REPORTING PROGRAM NO. R5-2013-0122
ATTACHMENT A**

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

I. Groundwater Monitoring

The provisions of Attachment A are set out pursuant to the Executive Officer's authority under California Water Code (CWC) Section 13267 to order Dischargers to implement monitoring and reporting programs. The purpose of groundwater monitoring required by these provisions is to confirm that management practices being employed for the wastewater retention system, land application areas, and animal confinement areas, are protective of groundwater quality and comply with Groundwater Limitation F.1 of the Waste Discharge Requirements General Order for New or Expanded Milk Cow Dairy Facilities (Order).

As an alternative to installing monitoring wells on an individual basis as set out in Section II, Dischargers subject to Order No. R5-2013-0122 (Order) may participate in a Representative Monitoring Program that meets the requirements set forth in Section III below. Dischargers choosing to participate in a Representative Monitoring Program must notify the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board). Notification to the Central Valley Water Board¹ must include identification of the Representative Monitoring Program that the Discharger intends to join. Dischargers choosing not to participate in a Representative Monitoring Program or those failing to notify the Central Valley Water Board of their decision to participate in a Representative Monitoring Program, will continue to be subject to the groundwater monitoring requirements of the Order and Monitoring and Reporting Program No. R5-2013-0122 (MRP). If necessary, the Executive Officer will prioritize these groundwater monitoring requirements based on the factors in Table 5 below.

A Representative Monitoring Program is not a Discharger. New or expanded dairy owners and operators are Dischargers and are responsible and liable for individual compliance and for determining if they are in compliance with the terms the Order. As set forth in Section III below, an eligible Representative Monitoring Program will convey information related to a Discharger's participation in the Representative Monitoring Program, conduct representative monitoring pursuant to an approved monitoring plan, and prepare and submit any required plans and monitoring reports. However, member Dischargers will be responsible for failure on the part of the Representative Monitoring Program to comply with the MRP.

¹ In lieu of individual discharger notifications to the Central Valley Water Board, a Representative Monitoring Program may provide to the Central Valley Water Board a list of participants that have signed up and met the initial requirements for participation in that Representative Monitoring Program.

If a Discharger participating in a Representative Monitoring Program wishes to terminate participation in the Program, the Discharger shall submit a Notice of Termination to the Executive Officer and the administrator of the Representative Monitoring Program. Administrators of a Representative Monitoring Program shall also notify the Executive Officer of a participant's failure to participate in their Representative Monitoring Program. A Representative Monitoring Program shall inform the Executive Officer of the participant's failure to participate within 45 days, which may result in the Executive Officer issuing a Notice of Termination to the Discharger stating that the Discharger is no longer able to participate in a Representative Monitoring Program as an alternative to individual groundwater monitoring. Termination from participation in a Representative Monitoring Program will occur on the date specified in the Notice of Termination, unless otherwise specified. Dischargers who voluntarily terminate their participation in a Representative Monitoring Program, receive a Notice of Termination from a Representative Monitoring Program, or receive a Notice of Termination from the Executive Officer, shall be individually subject to the groundwater monitoring requirements of the Order and MRP.

Pursuant to the CWC Section 13267, the Executive Officer may, at any time, order implementation of individual groundwater monitoring at an expanded or new dairy facility, even if the Discharger participates in a Representative Monitoring Program. Such order may occur, for instance, if violations of the Order are documented and/or the facility is found to be in an area where site conditions and characteristics pose a high risk to groundwater quality. In the event the Executive Officer orders implementation of individual groundwater monitoring to a participant of a Representative Monitoring Program, such an order shall constitute a Notice of Termination to the participant and the Discharger shall no longer be eligible to participate in a Representative Monitoring Program to comply with the groundwater monitoring requirements of the MRP.

II. Individual Monitoring Program Requirements

1. 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.

TABLE 5. GROUNDWATER MONITORING FACTORS FOR RANKING PRIORITY			
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 to 20	10	
	> 20	20	
Location of production area or land application area relative to a Department of Pesticide Groundwater Protection Area (GWPA).	Outside GWPA	0	
	In GWPA	20	
Distance (feet) of production area or land application area from an artificial recharge area 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	
Whole Farm Nitrogen Balance.	< 1.65	0	
	1.65 to 3	10	
	> 3	20	

Total Score: _____

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 (including the annular space outside of the well casing) from acting as a conduit for pollutant/contaminant transport. Each monitoring well shall be appropriately designed and constructed to enable collection of representative 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. More stringent practices shall be implemented if needed to prevent the well from acting as a conduit for the vertical migration of waste constituents.
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

<p><i>Monitoring Wells</i></p> <p><u>Quarterly</u>¹: Measurement of the depth to groundwater from a surveyed reference point to the nearest 0.01 foot in each monitoring well.</p> <p><u>Semi-annually</u>: Field measurements of electrical conductivity, temperature, and pH. Laboratory analyses for nitrate and ammonia.</p> <p><u>Within six months of well construction and every two years thereafter</u>: Laboratory analyses for general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, and chloride).</p>

¹ After two years of quarterly depth to groundwater measurements, the discharger may request reduction of frequency of depth to groundwater measurements to semi-annually upon demonstration there are no seasonal impacts to groundwater levels.

9. Groundwater samples from monitoring wells shall be collected as specified in the approved Monitoring Well Installation and Sampling Plan (MWISP).
10. The Discharger shall submit to the Executive officer an annual assessment of the groundwater monitoring data due 1 July of each year. The annual assessment may be attached to the annual report required in Section C of the MRP. The annual assessment shall include a tabulated summary of all analytical data collected to date including analytical lab reports for data collected during the past year. The assessment shall include an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided is representative of conditions upgradient and downgradient wastewater management area, production area and land application area of the dairy facility. The assessment shall also include an evaluation of the groundwater monitoring data collected to date with a description of the statistical or non-statistical methods used. The assessment must use methods approved by the Executive Officer. If the Discharger determines that the analytical methods required by this MRP are insufficient to identify whether site activities are impacting groundwater quality, the annual assessment must address Item II.11 below and employ the needed analyses during future monitoring events.
11. If the monitoring parameters required by this MRP are insufficient to identify whether site activities are impacting groundwater quality, the Discharger must employ all reasonable chemical analyses to differentiate the source of the particular constituent. This includes, but is not limited to, analyses for a wider array of constituents and chemical isotopes.
12. Within six years of initiating sampling activities, the Discharger shall submit to the Executive Officer a summary report presenting a detailed assessment of the monitoring data to evaluate whether site activities associated with operation of the wastewater retention system, corrals, or land application areas have impacted groundwater quality. This summary report can be required at an earlier date if evaluation by the Discharger or Central Valley Water Board staff indicates that the

assessment can be completed at an earlier date. This summary report shall also include detailed descriptions of management practices employed at the wastewater retention system, animal confinement areas, and land application areas along with the design standards of the wastewater retention system. The summary report must include an adequate technical justification for the conclusions incorporating available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality. The summary report is subject to approval by the Executive Officer. If monitoring data indicate that Groundwater Limitation F.1 of the Order has been violated, this assessment shall include a description of changes in management practices and/or activities that will be undertaken to bring the facility into compliance. Annual reports required in Section C of the MRP submitted after this summary report must include a discussion and schedule for implementation of changes in management practices and/or activities that are being taken and an evaluation of progress in complying with Groundwater Limitation F.1 of the Order.

13. At any time during the term of this permit, the Central Valley Water Board may notify the Discharger to submit assessments of groundwater monitoring data (including the annual reports and the summary report) electronically. Data shall be submitted in a digital format acceptable to the Executive Officer.

III. Representative Monitoring Program Requirements

To establish a Representative Monitoring Program in lieu of individual groundwater monitoring, the Representative Monitoring Program must have Executive Officer approval of a submitted Monitoring and Reporting Workplan. The Monitoring and Reporting Workplan shall include sufficient information for the Executive Officer to evaluate the adequacy of the proposed groundwater monitoring program to serve as an alternative to the installation of individual groundwater monitoring wells at dairies. The Monitoring and Reporting Workplan must explain how data collected at facilities that are monitored will be used to assess impacts to groundwater at facilities that are not part of the Representative Monitoring Program's network of monitoring wells. This information is needed to demonstrate whether collected facility monitoring data will allow identification of practices that are protective of water quality at all facilities represented by the Representative Monitoring Program, including those for which on-site data are not collected. The Monitoring and Reporting Workplan must additionally propose constituents the Representative Monitoring Program will monitor and the frequency of monitoring for each constituent identified. The Monitoring and Reporting Workplan must propose a list of constituents that is sufficient to identify whether activities at facilities being monitored are impacting groundwater quality. The list of constituents may necessarily be greater than the constituents required to be monitored at sites under individual orders (as listed in Table 6), as failure to determine whether groundwater has been impacted at a monitored facility will impair the ability to extrapolate findings to facilities where monitoring does not occur. At a minimum the baseline constituents shall include those required of individual groundwater monitoring systems.

1. Once the Monitoring and Reporting Workplan is approved, the Representative Monitoring Program shall begin the process of installing monitoring wells as prescribed in paragraphs 3-7 below.
2. Prior to installation of monitoring wells, the Representative Monitoring Program shall submit to the Executive Officer a 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 Representative Monitoring Program in writing that the MWISP is acceptable. The MWISP must be submitted within 60 days of Executive Officer approval of the Monitoring and Reporting Workplan.
3. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the well (including the annular space outside of the well casing) from acting as a conduit for pollutant/contaminant transport. Each monitoring well shall be appropriately designed and constructed to enable collection of representative samples of the first encountered groundwater.
4. 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 supersede the Well Standard of DWR, and the Representative Monitoring Program shall comply with the more stringent standards. More stringent practices shall be implemented if needed to prevent the well from acting as a conduit for the vertical migration of waste constituents.
5. 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.
6. Within 45 days after completion of any monitoring well network, the Representative Monitoring Program shall submit to the Executive Officer a 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. In cases where monitoring wells are completed in phases or completion of the network is delayed for any reason, monitoring well construction data are to be submitted within 180 days of well completion, even if this requires submittal of multiple reports.

7. Once the groundwater monitoring network is installed pursuant to an approved Monitoring and Reporting Workplan and paragraphs 3-6 above, the Representative Monitoring Program shall sample monitoring wells for the constituents and at the frequencies as specified in the approved Monitoring and Reporting Workplan. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest water table levels. In cases where the monitoring wells are completed in phases or completion of the monitoring well network is delayed for any reason, collection and analysis of groundwater samples from each well is to commence within 180 days of completion of that well.
8. Groundwater samples from monitoring wells shall be collected as specified in an approved MWISP.
9. The Representative Monitoring Program shall submit to the Executive Officer an Annual Representative Monitoring Report (ARMR). The ARMR shall be due by 1 April of each year and shall include all data (including analytical reports) collected during the previous calendar year. The ARMR shall also contain a tabulated summary of data collected to date by the Representative Monitoring Program. The ARMR shall describe the monitoring activities conducted by the Representative Monitoring Program, and identify the number and location of installed monitoring wells and other types of monitoring devices. Within each ARMR, the Representative Monitoring Program shall evaluate the groundwater monitoring data to determine whether groundwater is being impacted by activities at facilities being monitored by the Representative Monitoring Program. The submittal shall include a description of the methods used in evaluating the groundwater monitoring data. Each ARMR shall include an evaluation of whether the representative monitoring program is on track to provide the data needed to complete the summary report (detailed in Item III.10 below). If the evaluation concludes that information needed to complete the summary report may not be available by the required deadline, the ARMR shall include measures that will be taken to bring the program back on track.

The ARMR shall include an evaluation of data collected to date and an assessment of whether monitored dairies are implementing management practices that are protective of groundwater quality. If the management practices being implemented at a dairy being monitored are found to not be protective of groundwater quality, the Executive Officer may issue an order to the owner/operator of the monitored dairy to identify and implement management practices that are protective of groundwater quality prior to submittal of the report described in Item III.10 below.

10. No later than six (6) years following submittal of the first ARMR, the Representative Monitoring Program shall submit a Summary Representative Monitoring Report (SRMR) identifying management practices that are protective of groundwater quality for the range of conditions found at facilities covered by

- the Representative Monitoring Program. The identification of management practices for the range of conditions must be of sufficient specificity to allow participants covered by the Representative Monitoring Program and the Central Valley Water Board to identify which practices at monitored facilities are appropriate for facilities with a corresponding range of site conditions, and generally where such facilities may be located within the Central Valley (e.g., the summary report may need to include maps of the Central Valley that identify the types of management practices that should be implemented in certain areas based on specified site conditions). The summary report must include an adequate technical justification for the conclusions incorporating available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality. The summary report is subject to approval by the Executive Officer.
11. Assessments of groundwater monitoring data (including the annual reports and the summary report) are to be submitted electronically. Data shall be submitted in an electronic format acceptable to the Executive Officer.
 12. On July 1 following Executive Officer approval of the SRMR, each Discharger that is a participant covered by a Representative Monitoring Program shall include in their annual report required in Section C of the MRP a description of management practices currently being implemented at their wastewater retention system(s), land application area(s), and animal confinement area(s). If these management practices are not confirmed to be protective of groundwater quality based on information contained in the SRMR, and therefore are not confirmed to be sufficient to ensure compliance of the facility with Groundwater Limitation F.1 of the Order the Discharger's annual report shall identify which alternative management practices the participant intends to implement at its dairy facility and a schedule for their implementation (based on the findings of the SRMR). Management practices deemed to be protective of groundwater quality are subject to approval by the Executive Officer. With each annual report submitted after the first report following Executive Officer approval of the SRMR, each participant shall include within his or her annual report an update with respect to implementation of the additional or alternative management practices being employed by the Discharger to protect groundwater quality.
 13. Within three months of joining a Representative Monitoring Program, each Discharger that is a participant covered by a Representative Monitoring Program shall submit to the Central Valley Water Board a letter stating that they are voluntarily joining the Representative Monitoring Program, they are aware of the conditions and requirements to be a member of the Program, they intend to fully comply with the monitoring and reporting program and intent of the Program, and they are fully aware failure to comply with the Program may result in their removal from the Program and that they may be subject to enforcement by the Central Valley Water Board.

IV. Monitoring Well Installation and Sampling Plan (MWISP) (Applicable to both Individual and Representative Monitoring Program Requirements)

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

1. General Information:
 - a. Topographic map showing any existing nearby (about 2,000 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. In the case of a Representative Monitoring Program, this information must include an explanation of how the location, number, and depths of wells proposed will result in the collection of data that can be used to assess groundwater at sites with a variety of conditions that have joined the Representative Monitoring Program but are not being monitored as part of the monitoring network.
 - 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 accurately 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 (not less than 48 hours or more than 10 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.

V. Monitoring Well Installation Completion Report (MWICR)

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. 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 protection device (such as below-grade water-tight vaults, stovepipe, bollards, etc).
- h. All depth to groundwater measurements during field program.
 - i. Field notes from drilling and installation activities (e.g., all subcontractor dailies, as appropriate).
 - j. 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. Disposition 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 (e.g., ground surface, top of casing, etc.).

- c. Horizontal and vertical coordinates of well casing with cap removed (measuring point to nearest ± 0.01 foot).
- 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. R5-2013-0122
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.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Order R5-2013-0122

INFORMATION SHEET
REISSUED WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
EXISTING MILK COW DAIRIES

INTRODUCTION

This Information Sheet provides information to supplement, clarify, and elaborate upon the findings and requirements contained in the reissued Waste Discharge Requirements General Order for Milk Cow Dairies R5-2013-0122 (the "Dairy General Order"). This Information Sheet is considered a part of the Dairy General Order.

The Dairy General Order will serve as general Waste Discharge Requirements (WDRs) for discharges of waste from existing milk cow dairies. The Dairy General Order is not a National Pollutant Discharge Elimination System (NPDES) permit, and does not authorize discharges to surface waters that would otherwise require a NPDES permit.

All dairies receiving coverage under the Dairy General Order are required to:

- Monitor wastewater, soil, crops, manure, surface water discharges, and storm water discharges;
- Monitor surface water and groundwater in accordance with a monitoring and reporting program (regulated dairies have the option to join a Representative Groundwater Monitoring Program (RMP) in lieu of individual monitoring of first encountered groundwater);
- Implement a Waste Management Plan for the dairy production area;
- Implement a Nutrient Management Plan (NMP) for all land application areas;
- Retain records for the production area and the land application areas;
- Submit annual monitoring reports; and
- Improve or replace management practices that are found not to be protective of water quality.

BACKGROUND

Pursuant to Water Code section 13260, any person discharging or proposing to discharge wastes that could affect the quality of the waters of the state is obliged to file a report of that discharge with the appropriate regional water board (this report is referred to as a "Report of Waste Discharge" or "ROWD"). The regional water boards have the authority to waive this requirement pursuant to Water Code section 13269. In 1982, the California Regional Water

Quality Control Board, Central Valley Region (Central Valley Water Board or Board) adopted Resolution No. 82-036, which waived the ROWD requirement for most dairies in the Central Valley Region. This waiver remained in place until statutory changes to Water Code section 13269 resulted in the automatic expiration of all existing waivers on 1 January 2003.

Knowing that the existing waiver was due to expire, the Central Valley Water Board adopted Resolution R5-2002-0205 on 6 December 2002. This resolution stated that all dairies would be expected to obtain regulatory coverage under either:

- Individual or general waste discharge requirements prescribed by the Board pursuant to Water Code section 13263;
- A conditional waiver that the Board would adopt pursuant to Water Code section 13269; or
- Individual or general National Pollutant Discharge Elimination System (NPDES) permits, which would be issued by the Board pursuant to Federal law.

The Board rescinded Resolution R5-2002-0205 on 13 March 2003 because it had failed to issue general waste discharge requirements or a general NPDES permit, and thus dairy operators could not apply for regulatory coverage under either one of those permitting schemes before the deadlines in the resolution expired.

The Central Valley Water Board spent the next couple of years developing a regulatory strategy for addressing dairy wastes. On 8 August 2005, in furtherance of this strategy, the Board issued certified letters to the owners and operators of all known operating dairy facilities. These letters requested that the owners and operators submit a ROWD for each dairy (i.e., multiple RWODs if they owned or operated more than one dairy) to the Central Valley Water Board by 17 October 2005 (this correspondence is referred to as the "ROWD Request Letter"). On 3 May 2007, the Central Valley Water Board issued General Order R5-2013-0122 (the "2007 General Order"). The 2007 General Order regulated "existing milk cow dairies," defined as those dairies that were operating as of 17 October 2005 and that had filed a ROWD in response to the ROWD Request Letter.

Following the issuance of the 2007 General Order, the Asociación de Gente Unida por el Agua (a coalition of community residents and non-profit organizations) and the Environmental Law Foundation (collectively referred to as the "Petitioners") petitioned the 2007 General Order to the State Water Resources Control Board (State Water Board). The State Water Board dismissed the petition, concluding that it failed to raise substantial issues. The Petitioners then filed a petition for writ of mandate in the Sacramento County Superior Court (the "Superior Court"), arguing that the Central Valley Water Board failed to comply with the requirements of State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (*State Anti-Degradation Policy*) when it issued the 2007 General Order. The Superior Court denied the petition, and the Petitioners subsequently filed an appeal in the Third District Court of Appeal (the "Appellate Court"). The Appellate Court reversed the Superior Court's decision, and found that the Board's 2007 General Order did not comply with the requirements of the *State Anti-Degradation Policy*. (*Asociación de Gente Unida por el Agua*

v. Central Valley Regional Water Quality Control Bd. (hereafter *AGUA*) (2012) 210 Cal.App.4th 1255.)

Responding to the reversal, the Superior Court issued a Writ of Mandate that compels the Central Valley Water Board to, “[s]et aside the [2007 General Order] and reissue the permit only after application of, and compliance with, the State's anti-degradation policy ... as interpreted by the Court of Appeal in its opinion.” The reissued Dairy General Order is intended to set aside and replace the 2007 General Order in compliance with the Superior Court’s writ of mandate.

When the Board issued the 2007 General Order, it also issued a companion Monitoring and Reporting Program (MRP) pursuant to Water Code section 13267. This MRP included monitoring, record-keeping, and reporting requirements that were applicable to all dairies regulated by the 2007 General Order. However, due to resource constraints, the dairy industry and the Central Valley Water Board acknowledged that it would be infeasible for all the dairies to immediately implement individual monitoring programs: the dairies lacked the financial resources to install multiple monitoring wells at each facility, there were not enough consultants available to develop groundwater monitoring programs and install multiple monitoring wells at each dairy facility, and the Central Valley Water Board lacked the staff to analyze thousands of individual groundwater monitoring reports.

In order to efficiently assess the water quality impacts associated with various waste management practices employed at the dairies, the Central Valley Water Board proposed two parallel approaches to monitoring: 1) the dairies that elected to conduct their own monitoring could continue to do so under their individual monitoring programs, and 2) the dairies that would prefer to pool their resources could enroll in a RMP. After soliciting public comments on revisions to the MRP that would add an RMP option, the Board’s Executive Officer issued the revised version of the MRP (the “Revised MRP”) on 23 February 2011.

Under the RMP approach, individual dairies have the option of joining together to collectively monitor different waste management practices in a variety of geologic settings in lieu of developing individual monitoring programs. The collective monitoring effort is being used to develop a suite of effective management practices, and substantially decreases the expense and unnecessary duplication of implementing individual monitoring programs. Dairies utilizing management practices that are found not to be protective of groundwater quality will be required to improve upon those management practices. In accordance with the terms of the Revised MRP, the Board’s Executive Officer approved a Monitoring and Reporting Workplan for the Central Valley Dairy Representative Monitoring Program (CVDRMP), which is discussed in greater detail under the section entitled *How Will the Board Evaluate the Effectiveness of Management Practices?*, which is presented later on in this Information Sheet.

DAIRIES REGULATED BY THE DAIRY GENERAL ORDER

There were approximately 1,600 dairy operations that received regulatory coverage under the 2007 General Order. Since then, the number of dairy operations within the Central Valley Region has declined significantly, largely due to economic reasons. Since 2007, revenues from

milk produced by dairies have not kept up with the rising cost of doing business. Increased charges for producing and purchasing cattle feed and depressed milk prices have been the dominant factors in this decline, although regulatory compliance costs have also been a factor. The Board estimates that at this time about 1,300 dairy operations are covered by the 2007 General Order and will be subject to the reissued Dairy General Order.

The herd sizes at these dairy operations vary as operators strive to maintain a consistent milk production. Maintaining consistent milk production requires a dairy operator to manage the herd by continually producing calves, some of which eventually replace the dairy's producing herd over time, while excess stock are marketed for beef production or herd replacement elsewhere. Professionals at the University of California Davis estimate that 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 ROWDs that were submitted in response to the ROWD Request Letter, plus or minus 15 percent (to account for the normal variation in herd sizes). An increase in the number of mature dairy cows of more than 15 percent is considered an expansion, and the expanded dairy will be required to file a new ROWD to obtain regulatory coverage under a different General Order or an individual order.

As stated above, neither the 2007 General Order nor this Order purports to be a NPDES permit. Dairies that have a discharge requiring coverage under a NPDES permit must obtain coverage under Revised Order R5-2010-118, Revised Waste Discharge Requirements/NPDES Permit CAG015001 (as revised by Order R5-2011-0091). As Order R5-20011-0091 simply modifies Order R5-2010-0118, R5-2011-0091 does not exist as a separate order and the Expiration Date of Order R5-2010-0118 has not changed.

For a variety of reasons, the Central Valley Water Board may also determine that an individual dairy facility is not appropriately regulated under the Dairy General Order, and may require such a facility to be regulated under individual WDRs.

RATIONALE FOR ISSUING A GENERAL ORDER

The Central Valley Water Board has the authority to regulate waste discharges that could affect the quality of the waters of the state under Division 7 of the Water Code. The Board regulates most discharges by prescribing waste discharge requirements (including both waste discharge requirements issued under state law and waste discharge requirements issued under the federal Clean Water Act) or by issuing conditional waivers. All confined animal facilities (as defined in Cal. Code Regs., tit. 27, § 20164), including dairies, are subject to the Board's regulatory authority.

Water Code section 13263(i) describes the criteria that the Board uses to determine whether a group of facilities should be regulated under a general order (as opposed to individual orders). These criteria include:

- 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, and
- The discharges are more appropriately regulated under general WDRs rather than individual WDRs.

Dairy facilities are appropriately regulated by a general order because they: (a) involve similar types of operations, where animals are confined and where their wastes are managed by onsite storage, land application, or removal offsite; (b) the discharges from these facilities, which are primarily composed of animal waste, are similar; (c) the dairies are subject to regulations that impose the same or similar treatment standards; (d) discharges of dairy wastes have the same potential to impact waters of the state; and, (e) given the large number of facilities and their similarities, the dairies are more appropriately regulated under a general order.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

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 Central Valley Region, specify water quality objectives to protect those uses, and include implementation programs for achieving water quality objectives. The Basin Plans also incorporate, by reference, plans and policies of the State Water Board, including the *State Anti-Degradation Policy* and State Water Board Resolution 88-63 (*Sources of Drinking Water Policy*). The Dairy General Order contains requirements necessary to bring the discharges of waste from the dairies into compliance 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

The State Water Board adopted statewide standard definitions for beneficial uses of surface and ground waters. These standard definitions were used to identify the existing and potential future beneficial uses contained in the Basin Plans. Consideration also was given to the practicability of restoring uses which may have been lost because of water quality.

Surface Waters: Pursuant to Chapter II of the Basin Plans, the beneficial uses of surface water may include: municipal and domestic supply; agricultural supply; industrial process supply; industrial service supply; hydro-power generation; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning reproduction and/or early development; wildlife habitat; navigation; rare, threatened, or endangered species; groundwater recharge; freshwater replenishment; aquaculture; and preservation of biological habitats of special significance. The Sacramento River and San Joaquin River Basins Plan includes four additional beneficial use designations not specified in the Tulare Lake Basin Plan (agricultural stock watering, commercial and sport fishing, estuarine

habitat, and shellfish harvesting). Both Basin Plans contain a Table that lists the surface water bodies and the beneficial uses. Where water bodies are not specifically listed, the Basin Plans designate beneficial uses based on the waters to which they are tributary.

The beneficial uses are protected in the Dairy General Order by, among other requirements, a prohibition on the direct or indirect discharge of waste and/or storm water from the production area to surface waters, a prohibition on the discharge of wastewater to surface waters from cropland, a prohibition on 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 a prohibition on the discharge of waste from existing milk cow dairies to surface waters that causes or contributes to an exceedance of any applicable water quality objective or any applicable state or federal water quality criterion.

Ground waters: 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 or cause pollution or nuisance. Degradation of groundwater is allowed provided it is in accordance with this Dairy General Order.

Water Quality Objectives

Pursuant to Water Code section 13263(a), WDRs must implement the Basin Plans, and the Board must consider the beneficial uses of water, the water quality objectives reasonably required to protect those beneficial uses, other waste discharges, and the need to prevent nuisance conditions. 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. (Wat. Code, § 13050(h).) 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 water quality objectives are implemented in WDRs consistent with the Basin Plans' *Policy for Application of Water Quality Objectives*, which specifies that the Central Valley Water Board “will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.” To derive numeric limits from narrative water quality objectives, the Board considers relevant numerical criteria and guidelines developed and/or published by other agencies and organizations.

The primary waste constituents of concern (COC's) due to discharges of waste from dairies with respect to surface waters are: nitrogen in its various forms (ammonia and un-ionized ammonia, nitrate, nitrite, and total Kjeldahl nitrogen), phosphorus, potassium, salts (as measured by total dissolved solids and electrical conductivity), total suspended solids, and pathogens. In addition, 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 the production area and land application areas. Some portion of some of these chemicals may be commingled with process wastewater before it is stored in the retention pond.

The COC's due to discharges of waste from dairies with respect to groundwater are: nitrogen in its various forms (ammonia and un-ionized ammonia, nitrate, nitrite, and total Kjeldahl nitrogen), salts, and general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, and chloride). The discharge of waste from dairies must not cause surface water or groundwater to exceed the applicable water quality objectives for those constituents. If compliance cannot be immediately achieved, the Board may set a compliance time schedule for the discharger to achieve compliance with the water quality objectives. Under the Basin Plans, this time schedule must be "as short as practicable."

Water Quality Objectives and Federal Criteria for Surface Water¹

Water quality objectives that apply to surface water include, but are not limited to, (1) 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 Cal. Code Regs., tit. 22, §§ 64431 and 64444 and are applicable through the Basin Plans to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, and the salinity objectives; and (2) 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 C.F.R. §§ 131.36 and 131.38.)

¹ The Dairy 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.

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 Cal. Code Regs., tit. 22, §§ 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.

State Water Board Resolution 88-63 (The Sources of Drinking Water Policy)

The *Sources of Drinking Water Policy* states 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.
- d. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4. for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

Both Basin Plans include criteria for granting exceptions to municipal and domestic supply designations based on the *Sources of Drinking Water Policy*. The Tulare Lake Basin Plan also includes criteria for granting exceptions to the designation of beneficial uses for agricultural supply and industrial supply. The Tulare Lake Basin Plan specifies exceptions to the designated beneficial uses for some groundwater within the Tulare Lake Basin. Exceptions to the *Sources of Drinking Water Policy* are not self-implementing, but must be established in an amendment to the Basin Plan.

Title 27 of the California Code of Regulations

Title 27 of the California Code of Regulations prescribes minimum standards for animal waste at confined animal facilities. For surface water protection, Title 27 includes requirements for the 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 require 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, and minimize

infiltration of water into underlying soils in manured areas. Furthermore, retention ponds must be located in, or lined with, soils of at least 10 percent clay and no more than 10 percent gravel. (Cal. Code. Regs., tit. 27, § 22562(d).)

However, it is Central Valley Water Board staff's understanding that the retention pond standard was developed based on the assumption that manure solids contained within the wastewater would effectively reduce the permeability of the soils lining the wastewater ponds. This reduced permeability would result in a lowering of the pond leaching rate to a level thought to be protective of groundwater quality. An October 2003 report (the "Task 2 Report") by Brown, Vence, and Associates (BVA) confirmed that the "...current Title 27 requirements are insufficient to prevent groundwater contamination from confined animal facilities, particularly in vulnerable geologic environments." Adverse impacts have been detected in areas where groundwater is as deep as 120 feet below ground surface, and in some areas underlain by fine-grained sediments. Factors that appear to affect a clay-lined pond's ability to be protective of groundwater quality vary significantly from site to site due to native soil conditions, pond construction, pond age, manure properties, climate, pond operation, pond maintenance and depth to groundwater. Potential controlling factors appear to include: the inherent structure of the underlying soil, the moisture content of the unsaturated portion of the aquifer (vadose zone), the presence or absence of macropores or preferential pathways within the vadose zone (desiccation cracking, earthworm channels, development of root holes), and the oxidation reduction conditions present within the vadose zone and within the aquifer itself.

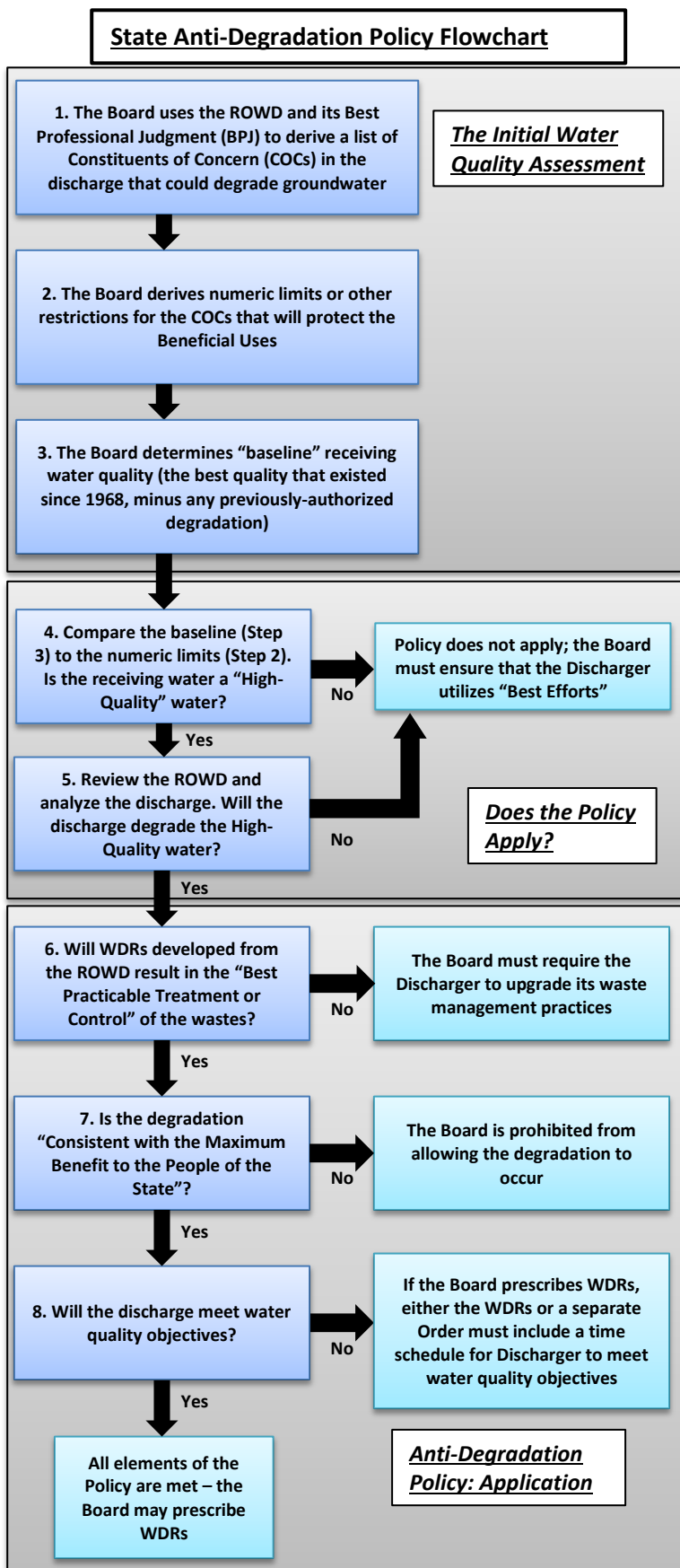
Resolution 68-16 (State Anti-Degradation Policy)

The *State Anti-Degradation Policy*, adopted by the State Water Board in October 1968, limits the Board's discretion to authorize the degradation of high-quality waters. This policy has been incorporated into the Board's Basin Plans. High-quality waters are those waters where water quality is more than sufficient to support beneficial uses designated in the Board's Basin Plan. Whether or not a water is a high-quality water is established on a constituent-by-constituent basis, which means that an aquifer can be considered a high-quality water with respect to one constituent, but not for others. (State Water Board Order WQ 91-10.)

The following provisions of the *State Anti-Degradation Policy* are directly applicable to the discharges regulated by the Dairy General Order:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.
2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and

(b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.



Generally speaking, these provisions require that the Board adopt standards and requirements to ensure the discharger controls the discharge by employing “best practicable treatment or control” methodologies to limit the extent of the degradation, and that the Board carefully consider whether the permitted degradation inheres to the maximum benefit to the people of the State when the Board prescribes waste discharge requirements that will result in the degradation of high-quality waters. The *State Anti-Degradation Policy* also requires that the Board prohibit waste discharges from resulting in water pollution or nuisance, though this is a requirement that also exists outside the context of the *State Anti-Degradation Policy*. (see Wat. Code, § 13263.)

The State Water Board has provided only limited guidance regarding the *State Anti-Degradation Policy*. The State Water Board’s Administrative Procedures Update 90-004 provides guidance for implementing *State Anti-Degradation Policy* and the Clean Water Act’s anti-degradation provisions (40 C.F.R. § 131.12.) in the context of NPDES permitting. Although APU 90-004 is not directly applicable to the Dairy General Order because nonpoint discharges from agriculture are exempt from NPDES permitting requirements, the Appellate Court found this document informative in interpreting the *State Anti-Degradation Policy*. The following analysis adheres to existing guidance and the Appellate Court’s decision in the *AGUA* case.

As recounted in the *AGUA* litigation, the Board erred when it issued the 2007 General Order because it failed to comply with the *State Anti-Degradation Policy*. The reissued Dairy General Order contains revisions designed to comply with the *AGUA* decision, which interpreted the requirements of the *State Anti-Degradation Policy*. The flow chart on this page describes the process that the Board generally uses to apply the *State Anti-Degradation Policy*, and the following discussion elaborates on how these requirements are applied in the context of the Dairy General Order.

The following sections describe the step-by-step approach for applying the Anti-Degradation Policy, followed by the direct application of this policy to the Dairy General Order.

The Initial Water Quality Assessment

Step 1: Due to the constituent-by-constituent nature of an anti-degradation analysis, the Board must first compile a list the waste constituents present in the discharge that could degrade groundwater. These constituents are referred to as “constituents of concern,” or COCs. The Board uses its best professional judgment to determine this suite of COCs, which is usually extrapolated from the ROWD that was submitted by the discharger.

Step 2: Once the Board has compiled the list of COCs, it then references numeric limits or other restrictions that would protect the beneficial uses associated with the receiving water. Some constituents, such as those constituents that have Maximum Contaminant Levels established in Title 22 of the California Code of Regulations, have numeric water quality objectives associated with them, while others have only narrative water quality objectives associated with them. For constituents that have only narrative water quality objectives associated with them, the Board derives numeric limits by considering relevant numerical criteria and guidelines developed and/or published by other agencies and organizations. (e.g., State Water Board, California Department of Health Services, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Game, U. S. EPA, U. S. Food and Drug Administration, National Academy of Sciences, U. S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations).

Step 3: The Board then makes a good-faith effort to determine best water quality that has existed since 1968, the year in which the anti-degradation policy was promulgated (often data from 1968 or earlier are unavailable). The Board then determines whether any subsequent lowering of water quality was due to a regulatory action taken by the Board. The best quality that has existed since 1968, minus any authorized degradation, becomes the “baseline” water quality².

Determining Whether the Anti-Degradation Policy is Triggered

Step 4: The Board compares the numeric limits derived in Step 2 with the baseline water quality derived in Step 3. For each constituent, if the baseline water quality is better than the derived

² Water quality control policies adopted subsequent to 1968 may alter the calculation of this baseline.

limits (i.e., the quality needed to support all of the beneficial uses), then the water is considered a “high-quality water.” If the receiving water is not a high-quality water for all of the COCs, then the *State Anti-Degradation Policy* does not apply.

Step 5: The Board determines whether the discharge will degrade the receiving water. The Board makes this determination by comparing the information contained in the discharger’s ROWD or other applicable information with the baseline water quality. If the discharge will not degrade the receiving water, then the *State Anti-Degradation Policy* does not apply. *Application of the State Anti-Degradation Policy’s Requirements*

Step 6: If the discharge will degrade a high-quality water, then the *State Anti-Degradation Policy* requires the Board to prescribe requirements that will result in the best practicable treatment or control (BPTC) of the wastes in the discharge. BPTC is an evolving concept that takes into account changes in the technological feasibility of deploying new or improved treatment or control methodologies, new scientific insights regarding the effect of pollutants, and the economic realities that regulated industries face. Because this concept evolves over time, standard industry practices that are considered BPTC today may not be considered BPTC in the future. And though “practicality” limits the extent to which a discharger must implement expensive treatment or control measures, the Board must ultimately ensure that discharges do not cause pollution or nuisance, thereby protecting those who rely on the quality of groundwater and surface waters.

Neither the Water Code nor the *State Anti-Degradation Policy* defines the term “best practicable treatment or control.” However, the State Water Board has stated that “one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality.” (See Order WQ 2000-07, at pp. 10-11). Furthermore, in a “Questions and Answers” document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to include:

“[A] comparison of the proposed method to existing proven technology; evaluation of performance data (through treatability studies); comparison of alternative methods of treatment or control, and consideration of methods currently used by the discharger or similarly situated dischargers.”

Though the Board is prohibited from specifying the design, location, type of construction, or particular manner in which a discharger may comply with a requirement, order, or decree (Wat. Code § 13360.), the Board can still compare the treatment or control practices that a discharger has described in its ROWD to the treatment or control practices employed by similarly-situated dischargers in order to make a BPTC determination. (State Water Board Order WQ 2000-7.) Furthermore, “practicability” dictates that the Board consider the costs associated with the treatment or control measures that are proposed in the ROWD.

Step 7: The *State Anti-Degradation Policy* also requires that the Board consider whether the degradation authorized in a permit is “consistent with the maximum benefit to people of the state.” For discharges subject to the federal Clean Water Act, it is only after “intergovernmental coordination and public participation” and a determination that “allowing lower water quality is

necessary to accommodate important economic or social development in the area in which the waters are located” that the Board can allow for degradation. (40 C.F.R. § 131.12.)

As described in the Question and Answers Document mentioned above, some of the factors that the Board considers in determining whether degradation is consistent with the maximum benefit to people of the State include: economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. USEPA guidance clarifies that the federal anti-degradation provision,

“... is not a ‘no growth’ rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in “high quality waters” is necessary to accommodate important economic or social development” (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4).

APU 90-004 requires the Board to consider both the costs to the discharger and the costs imposed upon the affected public in the NPDES context, and states that “[c]ost savings to the discharger, standing alone, absent a demonstration of how these savings are necessary to accommodate ‘important social and economic development’ are not adequate justification’ for allowing degradation.”

It is, however, important to keep the “maximum benefit to people of the state” requirement in context. Neither the *State Anti-Degradation Policy* nor the Water Code allows unreasonable effects to beneficial uses. Therefore, such unreasonable effects (such as the unmitigated pollution of a drinking water source) are not the focus of the Board’s inquiry, because they are legally prohibited. Instead, the *State Anti-Degradation Policy* requires the Board to consider the costs that may be imposed on other dischargers as a result of the degradation that the Board is allowing to occur. For example, if the Board allows a discharger to operate a sub-standard facility that degrades a high-quality groundwater, dischargers situated downstream (for surface waters) or downgradient (for groundwaters) from that discharge would be discharging to a receiving water that lacks any capacity to assimilate additional waste loads. This may impose higher treatment costs on the downstream/downgradient discharger.

Ultimately, the Board may allow degradation to occur following a demonstration that the degradation is consistent with the maximum benefit to the people of the state; the *State Anti-Degradation Policy* is not a no-growth or no-degradation policy. However, the Board must justify why this degradation is beneficial not only to the discharger, but to others reliant on the water quality of the receiving water body.

Step 8: the Board must ensure that discharges will not unreasonably affect present and anticipated beneficial use of such water, will not result in water quality less than that prescribed in relevant policies, and will not cause pollution or nuisance. The Water Code defines “pollution” to mean an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either the waters for beneficial uses or the facilities which serve these beneficial uses, i.e., violation of water quality objectives. (Wat. Code, § 13050(1).) The term

nuisance is defined as anything that is, (1) injurious to health, 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 an entire community or considerable number of persons; and (3) occurs during, or as a result of, the treatment or disposal of wastes. (Wat. Code, § 13050(m).) To constitute a nuisance, all three factors must be met.

The Board ensures that this component of the *State Anti-Degradation Policy* is met by requiring a discharger to comply with water quality objectives designed to protect all designated beneficial uses, thereby protecting those who rely on the quality of groundwater and surface waters.

The State Anti-Degradation Policy as Applied to the Dairy General Order

Steps 1-5 (Applied): Although background water quality varies significantly in those areas covered by the Dairy General Order, most receiving waters are considered high-quality waters for one or more constituents of concern, and wastes from dairy facilities will degrade these waters. As the court concluded, “it is certain that the water quality of [at least some of] the existing groundwater is better than the water quality objective, making the groundwater high quality water for antidegradation purposes. Water can be considered high quality for purposes of the antidegradation policy if it is determined to be so for any one constituent, because the determination is made on a constituent by constituent basis.” (AGUA at 1271.) Furthermore, evidence in the Administrative Record indicates that wastes discharged from the regulated dairies will degrade this high-quality water, thereby triggering the *State Anti-Degradation Policy*.

Step 6 (Applied): Given that the *State Anti-Degradation Policy* applies, the Board must ensure that the Dairy General Order requires regulated dairies to implement BPTC measures to minimize the amount of degradation that will occur.

Generally speaking, the waste management practices employed by dairies can be broken down into three distinct areas: production areas (including milk barns, feed storage areas, and corral areas), wastewater ponds, and land application areas. The following is a discussion of what the Board considers to be BPTC for each of these three components of the regulated dairy operations.

Best Practicable Treatment or Control Measures for the Production Area

The Dairy General Order considers the term “Production Area” to include milk barns, wash/sprinkler pens, feed and non-liquid manure storage areas, and corrals (i.e., animal confinement areas). For these areas, the most effective way to reduce or eliminate water quality impacts is to restrict the infiltration of waste in these areas. Title 3 of the California Code of Regulations (Title 3), sections 645 et seq., set specifications for milk dairy buildings, including:

- § 646.1 (Corrals, Ramps, and Surroundings). This section requires that dirt or unpaved corrals be graded to promote drainage and that cow washing areas shall be paved (concrete or equivalent) and sloped to a drain. Water troughs, permanent feed racks, and mangers shall have paved access, and water troughs shall have a drain to carry water away from the corrals;

- § 648(c) Requires that milk rooms be floored with concrete or other suitable material and be provided with a vented, trapped drain and §649(a) requires that milk barns be floored with concrete or other suitable material and be sloped to drain; and
- § 661 Requires that roof drainage from barns, milk houses, or shelters shall not drain into a corral unless the corrals are paved and properly drained.

In addition to the requirements of Title 3, the Dairy General Order requires that milk barns, including their related sprinkler pens and gutters be designed and maintained to convey all water that has contacted animal wastes or feed directly to the wastewater retention system, and that all production area structures must be constructed or otherwise designed so that clean rainwater is diverted away from manured areas, feed storage areas, and waste containment facilities, unless drainage is fully contained in the wastewater retention system. Dairy operators must design and maintain the animal confinement area (including corrals), and manure and feed storage areas in a manner that limits infiltration so that wastes, nutrients, and contaminants generated are directed to the manure retention pond(s). The Dairy General Order prohibits standing water in these areas as of 72 hours after the last rainfall (see Production Area Specification D-6 of the reissued Dairy General Order).

Best Practicable Treatment or Control Measures for Land Application Areas

Normal commercial farming practices, including the application of dairy wastes to cropland as fertilizer, can 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. Additional amounts of water are often applied to leach the salts below the root zones. These leached salts can cause impacts to groundwater or surface waters. Even using the most efficient irrigation systems and appropriate fertilizer application rates and timing to correspond to crop needs, irrigation of cropland may degrade high-quality groundwater. In addition, in land application 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, which may include constituents originating from the dairies, 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.

With respect to salts and nutrients, the key to limiting degradation and ensuring compliance with water quality objectives at the dairies' land application areas is an effective Nutrient Management Plan, which specifies the volume and composition of the wastewater that can be applied to land application areas without causing adverse groundwater impacts. The Board considers an effective Nutrient Management Plan to be BPTC for the land application areas. The majority of the dairies covered under the 2007 General Order had been operating for many years without a Nutrient Management Plan. In response, the Board required each dairy operator to develop and implement a Nutrient Management Plan, and the reissued Dairy General Order will continue this requirement.

Unlike most other groundwater-related components of a dairy's waste management strategy, Nutrient Management Plans have received a significant amount of attention from the USEPA. This is because precipitation-related discharges from land application areas are considered agricultural storm water discharges, and are therefore not subject to the federal Clean Water Act's CAFO regulations. However, this exemption applies only when the "...manure, litter, or process wastewater [at the land application area] 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..." (40 C.F.R. §122.23.) Therefore, the USEPA has taken a close interest in the "site specific nutrient management practices" for application of waste from large concentrated animal feeding operations to land application areas. The Dairy General Order mandates that dairies employ the management practices required by Title 40 Code of Federal Regulations Section 122.42(e)(1)(vi)-(ix).

Because the Dairy General Order requires compliance with the federal CAFO regulatory requirements, precipitation-related discharges from land application areas at facilities operating in compliance with this Order are considered agricultural storm water discharges. And since they are consistent with USEPA's "best practicable control technology," the technical standards for nutrient management represent BPTC for the purposes of compliance with the *State Anti-Degradation Policy*. In addition, the Dairy General Order requires dairies who utilize tile drain systems to identify their location and discharge point(s) and to monitor discharges from these systems. The Dairy General Order also specifies well and surface water setbacks and requires certification of backflow prevention for all irrigation wells (Standard Provisions 18 and Attachment B. VI [*Waste Management Plan for the Production Area for Existing Milk Cow Dairies*]). Additionally, the Dairy General Order's Land Application Specifications contains additional requirements regarding waste infiltration and soil moisture capacity limits for waste application.

Pond Requirements: Generally

The Dairy General Order includes requirements that all ponds must be verified by an engineer to have adequate capacity and structural integrity to hold generated process water and precipitation. All ponds must be managed and maintained to prevent breeding of mosquitoes and other vectors. Ponds shall not have small coves and irregularities around the perimeter of the water surface. Weeds shall be minimized in all ponds through control of water depth, harvesting, or other appropriate method, and dead algae, vegetation, and debris shall not be allowed to accumulate on the water surface. These measures are required elements of a BPTC program for all ponds, whether they are already existing ponds or whether they are new or expanded ponds.

Best Practicable Treatment or Control Measures for New or Expanded Ponds

Three counties in the Central Valley 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). For new or expanded ponds, the Board considers these more stringent design standards to be BPTC.

Kings County and Merced County require pond liners to have a maximum seepage rate of 1×10^{-6} centimeters per second (cm/sec). Four of the top ten milk producing states (Wisconsin, Pennsylvania, Michigan, and Washington) 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} 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^{-6} 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 liners³.

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 pond design requirements provide more groundwater protection than the Title 27 requirements, there are no known studies that fully evaluate the ability of any of these county, state, or NRCS pond liner requirements to protect groundwater quality. It would be difficult to determine if any proposed pond design would be protective of groundwater quality without an evaluation of 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. Proposed pond designs that do not include such an evaluation should be very conservative to assure protection of groundwater under any likely 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 at classified waste management units regulated under Title 27 of the California Code of Regulations (i.e., landfills and Class II surface impoundments) and a limited number of wastewater retention ponds at dairies.

The Dairy General Order provides a two-tiered approach that will allow the Discharger two options for retention pond design. 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 Cal. Code

³ National Resources Conservation Service, Agricultural Waste Management Field Handbook, Appendix 10D – Geotechnical, Design, and Construction Guidelines.

Regs., tit. 27, § 20340) between the two liners. 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 Existing Dairy Ponds

Existing dairy ponds were built to contain and store the large quantities of dairy cow wastes prior to discharge to land application areas. These ponds present a difficult challenge for the dairies that may be causing unacceptable groundwater impacts. This is because requiring the immediate retrofitting of existing ponds to meet Tier 1 or Tier 2 requirements (the Dairy General Order's requirements for new or expanded ponds) would be beyond practicable economic limits for most dairies (See Memorandum from John Schaap and Steve Bommelje, Provost & Pritchard to Theresa A. Dunham, Somach Simmons & Dunn (August 5, 2013), *Costs to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons* (Provost & Pritchard 2013); see also Memorandum from Annie AcMoody, Western United Dairymen to Theresa A. Dunham, Somach Simmons & Dunn (August 6, 2013), *Financial Impact to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons* (AcMoody 2013).) Specifically, the range of costs to retrofit lagoons range from an estimated low of \$180,000 for a single liner at a 300 milk cow dairy to almost \$1.4 million for a double liner at a 3000 milk cow dairy. (See Provost & Pritchard 2013, p. 3.) Considering the net loss in dairy operation revenues over the past five years and the likelihood of an inability to obtain financing, it would be near impossible for most dairy operations retrofit dairy lagoons and remain in operation. (AcMoody 2013, p. 4.) If forced to retrofit such lagoons, many dairy operations would likely go out of business. The widespread closure of dairies in the Central Valley would have regional and state economic impacts.

Considering the wide-spread economic impacts that would occur with respect to requiring application of Tier 1 or Tier 2 requirements to existing ponds, the Central Valley Water Board finds that BPTC for existing ponds constitutes an iterative process of evaluation that includes groundwater monitoring individually or through the RMP, assessment of data collected, evaluation of Existing Pond conditions and their impact on groundwater quality, and case studies that evaluate potential changes in management practices and/or activities that may be necessary to further protect groundwater quality from existing ponds.

The Board will use the SRMR (for dairies represented in the RMP) or individual Summary Monitoring Reports (SMRs), for dairies that are in an individual monitoring program, to determine whether upgrades to existing ponds will be required. Facilities where data demonstrate that an existing pond is resulting in degradation beyond what is authorized under this order will be required to upgrade facilities on a time schedule that is as short as practicable. Substituting alternative management practices for the existing ponds (such as reducing the water level in the ponds, dry-scrape, or other methods) would also be acceptable, provided those management practices are found to be protective of groundwater quality for the conditions present where they would be implemented. Regulated dairies that are found not to be protective

of underlying groundwater must upgrade their management practices on a time schedule that is as short as practicable, supported with appropriate technical or economic justification, but in no case may time schedules extend beyond 10 years from the date that the Summary Report or SRMR is approved by the Executive Officer.

Step 7 (Applied): In the case of the dairies regulated by the Dairy General Order, allowing the maximum extent of degradation allowed by law (i.e., degradation up to the water quality objectives that are protective of the designated beneficial uses) would allow the Board to focus its efforts on ensuring that the discharges do not impact sensitive populations that rely on the quality of the receiving waters. In other words, while the focus of the *State Anti-Degradation Policy* is on justifying degradation that will ultimately result in water quality somewhere between the “best water quality that has existed since 1968” and a numeric limit that is protective of all beneficial uses, the Board and the dairy industry acknowledge that their primary task lies in preventing pollution and protecting sensitive uses.

The Board acknowledges that significant degradation at dairies has occurred throughout the Central Valley Region due to historic practices. In issuing the Dairy General Order, the Board will allow the maximum extent of degradation allowed by law to occur. The Dairy General Order is structured in such a way as to compel the dairy industry to focus their available resources on meeting water quality objectives, thereby protecting communities that are dependent on groundwater. As the dairy industry develops more effective management practices in the coming years, the Board may re-evaluate this goal, and may impose more stringent requirements that reflect the availability of better practicable management practices.

Step 8 (Applied): Although dairy waste materials provide nutrients to crops, they can create pollution or 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.

While the Board recognizes that it may be impracticable for the dairy industry to make dramatic changes to its waste management practices overnight, or even in a few years, those dairies whose practices are found to not be protective of the underlying groundwater through required individual or representative monitoring must upgrade their operations to ensure compliance with water quality objectives on a time schedule that is as short as practicable.

Allowing regulated dairies to degrade high quality waters is consistent with maximum benefit to people of the State as long as that degradation does not result in detrimental impacts to beneficial uses over the long term. California’s dairy industry, built on the foundation of 1,563 family-owned dairies statewide⁴, is important to the economic well-being of the Central Valley. Dairy farms generate jobs in a variety of sectors, from employees on the farm, providers of farm and veterinary services, other farmers who grow feed, processors of milk and dairy products, and in transportation of feed, milk and dairy products, and many others. According to a

⁴ Source for this an all data on number of dairies, cows and farm gate value of milk:
CDFA.ca.gov/dairy/dairystatsannual.html

California Milk Advisory Board analysis⁵, California's dairy industry is responsible for creating a total of 443,574 jobs and \$63 billion in economic activity. The same report estimated that a typical dairy cow generates \$34,000 in economic activity annually and a herd of 100 cows creates about 25 jobs.

The economic value of the dairy industry is particularly important within the Central Valley, where 89 percent of the state's cows and 81 percent of the state's dairy farms are located, as well as a significant fraction of the state's 117 dairy processing plants. Moreover, the jobs generated in the Central Valley are of even greater importance given routine double-digit unemployment rates in many rural counties and a high reliance on a healthy agricultural sector. Furthermore, California dairy farms are a significant producer of the nation's milk supply. In 2012, California dairy farms produced about 41.7 million pounds of milk, which is about a fifth of the nation's milk supply. As such, California dairies play an important role in food and nutrition security for California and the nation.

Considering the economic significance of the Central Valley dairy industry as well as the important role Central Valley dairies play in providing adequate milk supplies to the nation, the Central Valley Water Board finds that maintaining the Central Valley dairy industry is to the benefit of the people of the state.

Verifying that the State Anti-Degradation Policy is Satisfied

Although not an explicit provision of the *State Anti-Degradation Policy*, the Appellate Court determined that the Dairy General Order does not comply with the *State Anti-Degradation Policy* without a monitoring program sufficient to determine whether the discharges are in compliance with the *State Anti-Degradation Policy*.

The primary method used to determine if water quality objectives and the requirements of the *State Anti-Degradation Policy* are being met is surface water and groundwater quality monitoring. The Dairy 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. Should discharges of manure, process wastewater, or storm water occur from the production area, the Dairy General Order requires discharge monitoring and chemical analysis to determine if an exceedance of a water quality objective has occurred. The Dairy General Order also requires monitoring of the first storm water discharge of the year to surface waters from land application areas on a rotating basis (1/3 of the fields per year); and tailwater discharges to surface waters from the land application areas if they have occurred less than 60 days following an application of manure and/or process wastewater. Likewise, the Dairy General Order requires individual or

⁵ <http://www.californiadairyroom.com/node/289>, study by J/D/G Consulting using economic output multipliers developed by the U.S. Department of Commerce, Bureau of Economic Analysis. Based on 2008 data (size of the California dairy industry in number of cows has declined about 3.4 percent since 2008 but the economic impact of the industry is expected to be roughly similar today as to 2008 due to slightly higher overall levels of milk production).

representative groundwater monitoring of natural background water quality and the water quality downgradient of the waste management units (production area, corrals, and land application areas).

Monitoring and Reporting Program R5-2013-0122 (MRP) requires dairy operators to sample domestic and irrigation supply wells on their property, and to either monitor first-encountered groundwater at their facility or participate in an approved representative groundwater monitoring program. The purpose of requiring monitoring of water supply wells includes identifying the quality and trends of water being used at the dairy and the amount of nutrients contained in irrigation water so it can be accounted for in the development of the required nutrient management plan. The purpose of requiring monitoring of first-encountered groundwater is to evaluate current management practices in order to determine whether such practices are protective of groundwater quality at the most vulnerable point. Groundwater monitoring at existing dairies is necessary to: determine background groundwater quality, determine existing groundwater conditions near retention ponds, production areas, and land application areas, determine whether improved management practices need to be implemented, and confirm that any improved management practices will have the desired result on groundwater quality.

This Order requires the Discharger to report any noncompliance that endangers human health or the environment or any noncompliance with the Prohibitions contained in the Order within 24 hours of becoming aware of its occurrence. The Dairy General Order also requires the Discharger to submit annual monitoring reports which contain the analytical results of laboratory data, including all laboratory analyses (including Chain of Custody forms and laboratory QA/QC results) for surface and groundwater monitoring. Additionally, an annual assessment of groundwater monitoring is required. The assessment must include an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided are representative of conditions upgradient and downgradient of the wastewater management area, production area, and land application area of the dairy facility.

Similar to the individual groundwater monitoring program, the representative groundwater monitoring program is required to submit annual monitoring reports and an evaluation of data collected to date and an assessment of whether participating dairies are implementing management practices that minimize degradation of high quality groundwaters and are protective of beneficial uses.

The Central Valley Water Board recognizes that monitoring the effectiveness of the dairies' waste management practices and their effect on groundwater is needed to verify that water quality is adequately protected and the intent of the anti-degradation policy is met. Accordingly, the Dairy Order, in conjunction with the MRP, requires additional groundwater monitoring that must be conducted on an individual dairy basis or through Representative Monitoring Programs (RMPs). Under the terms of the Dairy Order and MRP, all dairies subject to the terms of the Dairy Order must either conduct their own groundwater monitoring or actively participate in a RMP. Currently, most dairies subject to the Dairy Order (more than 98 percent) are members of an RMP.

Both the individual groundwater monitoring provisions and the RMP's monitoring requirements are designed to measure water quality data over time in first-encountered groundwater. An RMP is further required to conduct such monitoring on a variety of dairy farms that represent the overall range of conditions on dairies within the Central Valley. This means for a RMP that a variety of physical site conditions must be monitored, such as varying soil types and depth to groundwater. Varying management conditions must also be measured, such as different types of crops, irrigation methods, waste storage structures and animal housing.

It is recognized that in many cases, a single set of groundwater monitoring data, or even monitoring data over a period of months or years, may not be sufficient to determine the effectiveness of existing management practices. Evaluating groundwater results over an extended period of time, in conjunction with gathering data regarding existing surface practices, is necessary to determine whether water quality is being protected or is being unreasonably impacted.

Waters that are Not High Quality: The "Best Efforts" Approach

When a receiving water body quality exceeds or just meets the applicable water quality objective due to naturally-occurring conditions or due to prior Board-authorized activities, it is not considered a high-quality water, and it is not subject to the requirements of the *State Anti-Degradation Policy*. However, where a groundwater constituent exceeds or just meets the applicable water quality objective, the Board must set limitations no higher than the objectives set forth in the Basin Plan. This rule may be relaxed if the Board can show that "a higher discharge limitation is appropriate due to system mixing or removal of the constituent through percolation through the ground to the aquifer." (State Water Board Order No. WQ 81-5.) However, the Board should set limitations that are more stringent than applicable water quality objectives if the more stringent limitations can be met through the use of "best efforts." (State Water Board Order No. WQ 81-5.)(*City of Lompoc*) The "best efforts" approach involves the establishment of requirements that require the implementation of reasonable control measures. Factors which are to be analyzed under the "best efforts" approach include the water quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance. (*City of Lompoc*, at p. 7.) The State Water Board has applied the "best efforts" factors in interpreting BPTC. (see State Water Board Order Nos. WQ 79-14 and WQ 2000-07.)

In summary, the Board may establish requirements more stringent than applicable water quality objectives even outside the context of the *State Anti-Degradation Policy*. The "best efforts" approach must be taken where a water body is not "high quality" and the antidegradation policies are accordingly not triggered.

California Environmental Quality Act

The Central Valley Water Board adopted a Negative Declaration in 1982 concurrent with the adoption of Resolution 82-036, which waived waste discharge requirements for milk cow dairies. The adoption of the Dairy General Order, which prescribes regulatory requirements for existing

facilities in order to ensure the protection of groundwater resources, is exempt from the requirements of the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.) based on the following three categorical exemptions:

- California Code of Regulations, title 14, section 15301 exempts the “operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features” from environmental review. Eligibility under the Dairy General Order is limited to milk cow dairies that were existing facilities as of 17 October 2005, and the Order does not authorize the expansion of these facilities. The 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.
- California Code of Regulations, title 14, section 15302 exempts 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...” The Dairy General Order will likely require covered dairies to replace or reconstruct waste management systems to ensure compliance with the Order’s requirements.
- California Code of Regulations, title 14, section 15302 exempts “... 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 Dairy General Order will require covered dairies to make improvements to their waste management systems that will result in only minor alterations to land, water, and/or vegetation.

The majority of the approximately 1,600 dairies covered under the initial Dairy General Order operated under a waiver program that was in effect from 1982 to December 2002.

Approximately 86 of those existing facilities were operating under either an individual WDR Order or a 1996 General WDR Order. This Dairy General Order imposes significantly more stringent requirements compared to the previous WDRs or the waiver of WDRs.

The Dairy 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 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) implement 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 and specifications in the Dairy General Order; (4) document that no cross connections exist that would allow the backflow of wastewater into a water supply 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 to minimize infiltration of wastewater and leachate from these areas to the underlying soils.

In the MRP, the Board is requiring the monitoring of discharges, surface water, groundwater, storm water, tile drainage water, and tailwater to determine compliance with the Dairy General Order.

Central Valley Salinity Alternatives for Long-Term Sustainability

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten achievement of water quality objectives in Central Valley surface waters and groundwater. The Dairy General Order requires actions that will reduce nitrate discharges and should result in practices that reduce salt loading. The Central Valley Water Board intends to coordinate all such actions with the CV-SALTS initiative. CV-SALTS may identify additional actions that need to be taken by existing milk cow dairies and others to address these constituents. The Dairy General Order can be amended in the future to implement any policies or requirements established by the Central Valley Water Board as a result of the CV-SALTS process.

REQUIREMENTS AND ENFORCEMENT OF THE DAIRY GENERAL ORDER

What are Dairy Wastes, and what are their Potential Impacts to Water Quality?

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 in solid form 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, and 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 nutrient monitoring, discharge monitoring, groundwater monitoring (individual or representative) and continuous tracking of materials being taken off-site for utilization.

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 review of dairy manure by a University of California Committee of Experts on Dairy Manure Management (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 provides some challenges due to the complexity of nitrogen in the soil-crop system. Soil nitrogen occurs primarily in three different forms - organic nitrogen, ammonium, and nitrate. Sources of organic nitrogen in soil include crop residue, the soil organic matter pool, and dairy waste applications. Organic nitrogen will mineralize to ammonium over time (one to seven years according to the UCCE Review). 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.

Ammonium nitrogen is immediately available to the plant, but also sorbs to soil particles. Ammonium nitrogen that is unused by the plant remains in the soil and is converted to nitrate typically within days to weeks under oxidizing conditions which are present in much of the Central Valley. Nitrate is also immediately available to the plant, but unlike organic nitrogen and ammonium nitrogen it does not adsorb to soil particles, rather it is in a dissolved form and moves readily with soil water.

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 by nitrifying bacteria (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 Central Valley Region, if not properly managed. Runoff from manured 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 UCCE 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.

Prior to the issuance of the 2007 General Order, the Central Valley Water Board had documented many discharges of waste from existing milk cow dairies to surface water. Between 2004 and 2007, approximately 70 Dischargers had received Notices of Violation from the Central Valley Water Board for such discharges. The Notices of Violation required immediate cleanup of the discharge and either remediation of the cause of the discharge or a plan with an implementation schedule for such remediation. Additional formal enforcement can be taken based on a case-by-case evaluation of the circumstances. Such enforcement could include the issuance of Administrative Civil Liability by the Board or referral to prosecutors for civil or criminal action.

This General Order includes prohibitions, specifications, and provisions for the existing ponds and new ponds, the production area and land application areas that are consistent with 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 exceedances 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.

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.

How Will the Board Regulate the Discharge of These Wastes?

Prohibitions: The Dairy General Order includes a number of prohibitions to protect surface and groundwater quality, and to ensure that waste discharges not regulated by this Order are prohibited unless otherwise regulated by another Order of the Central Valley Water Board.

General Specifications: The Dairy General Order includes a number of General Specifications that require dairy facilities regulated under this Order to: maintain and retain process wastewater together with all precipitation and drainage through manured areas up to including a 25-year, 24-hour storm; protect ponds and manured areas from inundation or washout by overflow from any stream channel at least during 20-year peak stream flows, and for many facilities be protected against 100-year peak stream flows; direct all precipitation and surface

drainage from outside of the dairy away from manured areas unless such drainage is fully contained; not apply manure and process wastewater closer than 100 feet to vulnerable pathways (e.g., down gradient surface waters, well heads) unless there are sufficient vegetated buffers or physical barriers; and, not use unlined ditches, swales or earthen-berm channels to store process wastewater, manure or tailwater.

Pond Specifications: The Dairy General Order includes requirements that all ponds must be verified by an engineer to have adequate capacity and structural integrity to hold generated process water and precipitation. Specifically, the level of waste in retention ponds shall be kept a minimum of two feet from the top of each aboveground embankment and a minimum of one foot from the ground surface of each belowground pond. All ponds must be managed and maintained to prevent breeding of mosquitoes and other vectors. Ponds shall not have small coves and irregularities around the perimeter of the water surface. Weeds shall be minimized in all ponds through control of water depth, harvesting, or other appropriate method, and dead algae, vegetation, and debris shall not be allowed to accumulate on the water surface.

New or Reconstructed Pond Specifications: New or Reconstructed Ponds must be designed to meet specified Tier 1 or Tier 2 standards and design for such New or Expanded Ponds must be approved by the Executive Officer. Tier 1 standards consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system. Tier 2 standards are consistent with Natural Resource Conservation Service Practice Standard 313 or equivalent and the Discharger has demonstrated through submittal of technical reports that the alternative design will comply with the groundwater limitations of this Order.

Existing Pond Specifications: In addition to the general pond specifications, ponds in existence as of 3 May 2007 must be evaluated to determine whether they are protective of underlying groundwater. This will be accomplished through compliance with an individual monitoring program or by participation in the Representative Monitoring Program. When existing ponds are found not to be sufficiently protective of underlying groundwater, a dairy must upgrade the pond in accordance with the time schedule for compliance detailed in section M. of the reissued Dairy General Order. Alternatively, if groundwater monitoring demonstrates that a discharge of waste threatens to exceed a water quality objective, the Executive Officer may issue an order to the owner/operator of the monitored dairy to identify and implement management practices that are protective of groundwater quality on a schedule that is as short as practicable (reissued Dairy General Order, General Specification B.5).

Production Area Specifications: The production area includes the barns, corrals, milk parlors, manure and feed storage areas, process water conveyance facilities and any other area of the dairy facility that is not the land application area or retention ponds. The General Order includes a number of requirements that apply to the production area, including: roofs, buildings, and non-manured areas within the production area shall be constructed and/or designed so that clean rainwater is diverted away from manured areas and waste containment facilities; drainage from the roofs of barns, milk houses, or shelters shall not drain into corrals unless the corrals are

properly graded and drained; all portions of the production area shall be designed and maintained to convey all water that has contacted animal wastes or feed to the wastewater retention system and shall be designed and maintained to minimize standing water. Standing water is not to be present as of 72 hours after the last rainfall. Dischargers shall implement any newly identified management practices/activities from the Summary Representative Monitoring Report which are applicable for their facility on a time schedule that is as short as practicable but cannot exceed 10 years.

Land Application Area Specifications: This General Order includes land application specifications that require Dischargers to develop and implement a Nutrient Management Plan (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. The results of this monitoring are to be used in the development and implementation of the NMP. The Dairy 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.

If existing management practices implemented in the land application area(s) are found not to be sufficiently protective of underlying groundwater, a dairy must change its management practices in accordance with the time schedule for compliance detailed in section M. of the reissued Dairy General Order. Alternatively, if groundwater monitoring demonstrates that a discharge of waste threatens to exceed a water quality objective, the Executive Officer may issue an order to the owner/operator of the monitored dairy to identify and implement management practices that are protective of groundwater quality on a schedule that is as short as practicable (Reissued Dairy General Order, General Specification B.5)

Closure Provisions: This General Order includes a provision that 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. These closure requirements ensure compliance with the provisions of the *State Anti-Degradation Policy*.

Receiving Water Limitations: This Order includes Groundwater Limitations that require the discharge of waste at existing milk cow dairies not cause the underlying groundwater to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

These limitations are effective immediately except where Dischargers are in compliance with the requirements of Sections II or III of the Monitoring and Reporting Program R5-2013-0122, Attachment A, and such Dischargers are implementing management practices/activities on a time schedule that is as short as practicable. For Dischargers participating in the RMP, management practices/activities must be implemented on a time schedule that is as short as practicable and that is consistent with the Time Schedule for Compliance (section M.) contained in the reissued Dairy General Order.

How Will the Board Evaluate the Effectiveness of Management Practices?

This Dairy General Order includes a provision that requires compliance with the MRP, 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 MRP 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
- tile drainage 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

Specifically, the Dairy General Order requires Dischargers to monitor, either individually or through the RMP, first encountered groundwater upgradient and downgradient of the production area, retention ponds, and land application areas. The purpose of the groundwater monitoring program is to determine whether management practices being employed at the dairies do not

cause receiving waters to exceed applicable groundwater objectives and confirm compliance with the requirements of this order.

The Dairy Order contains significant requirements for dairies that are designed to be protective of surface and groundwater quality while also being practicable and economically feasible. These include implementation of nutrient management plans prepared by certified specialists (including testing and measurement of manure, irrigation water, soil and plant tissue to track nutrient flow), and implementation of waste management plans prepared by professional engineers. The Dairy Order practices and design and maintenance standards include measures that apply to all areas of the dairy farm, including the crop production areas, existing manure retention ponds and animal housing areas, including all barns and corrals.

These practices (with the exception of certain pond standards that apply only to new or reconstructed ponds) are already in place, were developed over time with expert input from dairy professionals, the United States Department of Agriculture Natural Resources Conservation Service and the University of California⁶ and are expected to reduce impacts to water quality from the operation of dairy facilities. However, the Regional Board recognizes that monitoring the effectiveness of these practices is needed to verify that they protect water quality adequately and under a variety of conditions. Accordingly, the Dairy Order in conjunction with the MRP requires additional groundwater monitoring that must be conducted on an individual dairy basis or through Representative Monitoring Programs (RMPs). All dairies subject to the Dairy Order must either conduct their own groundwater monitoring or actively participate in a RMP. Currently, most dairies subject to the Dairy Order (more than 98 percent) are members of an RMP.

Individual Groundwater Monitoring: The individual groundwater monitoring program requires the Discharger to submit a Monitoring Well Installation and Sampling Plan (MWISP) which details the installation of a sufficient monitoring well network to characterize groundwater flow direction and gradient beneath the site; natural background (unaffected by the Discharger or others) groundwater quality upgradient of the facility; and groundwater quality downgradient of the production area, retention ponds, and the land application areas.

Under the individual groundwater monitoring program, the Discharger is required to submit to the Executive officer an annual assessment of the groundwater monitoring data which includes analytical lab reports for data collected during the past year and a tabulated summary of all analytical data collected to date. The annual assessment requires an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided are representative of conditions upgradient and downgradient of the wastewater management area, production area, and land application area of the dairy facility. If the monitoring parameters used to evaluate groundwater quality are found to be insufficient to identify whether site activities are impacting groundwater quality, the Discharger must employ all reasonable chemical analyses to differentiate the source of the particular constituent. This

⁶ See "Managing Dairy Manure in the Central Valley of California," published by the University of California Committee of Experts on Dairy Manure Management, 2005.

includes, but is not limited to, analyses for a wider array of constituents and chemical isotopes. Within six years of initiating sampling, or at an earlier date if required by the Executive Officer, a Discharger conducting individual sampling is required to submit a summary report that presents a detailed assessment of the monitoring data to evaluate if site activities associated with the operation have impacted groundwater quality. The Summary Report is subject to Executive Officer approval and must include a description of changes in management practices or activities if the data indicate that Groundwater Limitation D.1 of the Order has been violated.

Representative Monitoring Program: As an alternative to installing monitoring wells on an individual basis, dischargers may participate in a Representative Monitoring Program. The Representative Monitoring Program is a data collection and analysis effort that will develop a knowledge base from a subset of Central Valley dairy farms that will support conclusions with respect to existing management practices and their ability to be protective of groundwater quality that are applicable to non-monitored dairies covered under the Dairy General Order.

It is recognized that a single set of monitoring data, or even monitoring data over a short period of months or years, may not be sufficient to determine the effectiveness of existing practices. In many cases, because of time lags of weeks, months or even years between surface practices and resulting effects in groundwater, the effects of improved management practices will not be reflected immediately in monitoring wells. Evaluating these results over time and in conjunction with data regarding surface practices and other data is necessary to determine whether water quality is being protected or is being unreasonably impacted. In order to provide time for the development of this knowledge base, a period of six years has been allotted for the installation of groundwater monitoring wells, collection and chemical analysis of the groundwater samples, and assembly of an adequate data set for statistical evaluation of the data. The completed knowledge base will be utilized to identify management practices for the various management units (i.e., production areas, land application areas and wastewater ponds) that are protective of groundwater quality for the range of conditions found at facilities covered by the Representative Monitoring Program.

Dischargers choosing to participate in a Representative Monitoring Program must notify the Central Valley Water Board. Notification to the Central Valley Water Board must include identification of the Representative Monitoring Program that the Discharger intends to join. Dischargers choosing not to participate in a Representative Monitoring Program will continue to be subject to individual groundwater monitoring program requirements.

Representative Monitoring Programs are required to submit a monitoring and reporting workplan for Executive Officer approval. The workplan must explain how data collected at facilities that are monitored will be used to assess impacts to groundwater at facilities that are not part of the Representative Monitoring Program's network of monitoring wells. This information is needed to demonstrate that data collected at the representative facilities allows for identification of practices that are protective of water quality at all facilities represented by the Representative Monitoring Program, including those for which on-site data are not collected. The Monitoring and Reporting Workplan must additionally propose constituents the Representative Monitoring Program will monitor and the frequency of monitoring for each constituent identified. The

Monitoring and Reporting Workplan must propose a list of constituents that is sufficient to identify whether activities at facilities being monitored are impacting groundwater quality, and by extension if other “represented” facilities may also be impacting groundwater quality due to similar management units and site conditions.

To date, the Central Valley Dairy Representative Monitoring Program (CVDRMP) submitted a Phase 1 workplan to establish a Representative Monitoring Program. On 9 September 2012, the Executive Officer conditionally approved the first phase of the CVDRMP Monitoring and Reporting Workplan and Monitoring Well Installation and Sampling Plan for Existing Milk Cow Dairies. The workplan prepared by the CVDRMP consisted of 18 dairies and 126 dedicated monitoring well sites. Of these well sites, CVDRMP constructed 108 as nested wells (i.e., two wells in one borehole) with the remaining 18 well sites being pre-existing, single-well facilities, for a total of 234 wells.

On 6 June 2012 the CVDRMP submitted a Phase II workplan (approved by the Executive Office on 27 August 2012) which expanded the program’s monitoring efforts to incorporate 24 additional dairies, including several dairies with numerous pre-existing monitoring wells that have been subject to academic research for many years. CVDRMP now collects data from monitoring wells at 42 Central Valley dairies from Tehama County in the north to Kern County in the south, with 440 wells at 274 well sites.

As part of its Representative Monitoring Program, CVDRMP will examine conditions in first encountered groundwater beneath a select number of Central Valley dairies over time. The Representative Monitoring Program will extrapolate monitoring results from dairy farms monitored under the program to non-monitored member dairy farms to evaluate dairy operations and management practices for specific waste management units (land application areas, production areas, and wastewater ponds), to facilitate the evaluation of cause and effect relationships between subsurface loading of nutrients and salts, and to establish current groundwater quality conditions. For example, dairy management practices on coarse-grained/sandy soils over shallow groundwater that result in groundwater quality improvements beneath cropped manure application fields that are part of the Representative Monitoring Program are expected to produce similar results beneath non-monitored fields of similar soil types, in areas of similar precipitation patterns, and similar application practices. The same rationale applies to the production area and the liquid manure (i.e., wastewater) storage ponds. Representative monitoring is designed to identify a causal link between groundwater chemical characteristics and dairy management practices specific to management units. This includes the identification of groundwater chemical changes in response to changing management practices.

The Representative Monitoring Program is required to submit (on behalf of its member Dischargers) to the Executive Officer an Annual Representative Monitoring Report (ARMR) which describes the monitoring activities (including a tabulated summary of groundwater analytical data) conducted by the Representative Monitoring Program, and identifies the number and location of installed monitoring wells and other types of monitoring devices. Within each ARMR, the Representative Monitoring Program must evaluate the groundwater monitoring data to determine whether groundwater is being impacted by activities at facilities being monitored by

the Representative Monitoring Program. The submittal must include a description of the methods used in evaluating the groundwater monitoring data.

No later than six (6) years following submittal of the first ARMR, the Representative Monitoring Program must produce a Summary Representative Monitoring Report (SRMR) identifying management practices for the various management units (i.e., production areas, land application areas and wastewater ponds) that are protective of groundwater quality for the range of conditions found at facilities covered by the Representative Monitoring Program. The identification of management practices for the range of conditions must be of sufficient specificity to allow participants covered by the Representative Monitoring Program and the Central Valley Water Board to identify which practices at monitored facilities are appropriate for facilities with a corresponding range of site conditions, and generally where such facilities may be located within the Central Valley (e.g., the summary report may need to include maps of the Central Valley that identify the types of management practices that should be implemented in certain areas based on specified site conditions). The summary report must include adequate technical justification for the conclusions incorporating available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality. Further, the SRMR must include a proposed schedule for implementation of management practices that are protective of groundwater quality that is as short as practicable.

Each ARMR must include an evaluation of whether the representative monitoring program is on track to provide the data needed to complete the SRMR. If the evaluation concludes that information needed to complete the summary report may not be available by the required deadline, the ARMR shall include measures that will be taken to bring the program back on track. The ARMR shall include an evaluation of data collected to date and an assessment of whether monitored dairies are implementing management practices that are protective of groundwater quality. If the management practices being implemented at a dairy being monitored are found to not be protective of groundwater quality, the Executive Officer can issue an order to the owner/operator of the monitored dairy to identify and implement management practices that are protective of groundwater quality prior to submittal of the report.

Both the individual groundwater monitoring provisions and the RMP monitoring requirements are designed to measure water quality data in first-encountered groundwater. A RMP is further required to conduct such monitoring on a variety of dairy farms that represent the overall range of conditions on dairies within the Central Valley. This means for a RMP that a variety of physical site conditions must be monitored, such as varying soil types and depth to groundwater. Varying management practices must also be measured, such as different types of crops, irrigation methods, waste storage structures, and animal housing.

In cases where water quality is not being sufficiently protected, additional time is needed to identify additional practices for the various dairy facility areas that both improve water quality protection, and are feasible and practicable for dairy operators to implement. This is a chief goal of the RMP process and work is actively underway, to be completed no later than 2019, to identify and verify additional practices where necessary to protect beneficial uses of

groundwater. This process includes ongoing monitoring and analysis, field studies of management alternatives, and more intensive evaluation of existing practices, including existing manure storage ponds and nutrient management plans.

Considering the need to evaluate the effectiveness of current practices that are being implemented to comply with the Dairy Order, the Regional Board finds that it is not possible in all circumstances for dairy facilities to immediately comply with groundwater limitations. Accordingly, the Dairy Order provides dischargers with an appropriate amount of time to comply with such limitations. The time being provided is consistent with the time frames established in the MRP with respect implementation of RMPs.

Individual Monitoring Orders: The Executive Officer has issued orders to each dairy that require the dairies to either submit individual groundwater monitoring and sampling plans or join a representative groundwater monitoring program. Submitted groundwater monitoring and sampling plans must include a schedule to install groundwater monitoring wells into first encountered groundwater, to collect representative groundwater samples from the wells and have these samples analyzed by a State-certified laboratory for selected constituents, and to report the results back to the Board. The first phase of orders were issued to those dairies where nitrate-nitrogen was detected at 10 milligrams per liter or more in any one domestic well, agricultural well, or subsurface (tile) drainage system in the vicinity of the dairy. The Executive Officer further prioritized the orders 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 was completed by 1 July 2009; and any other pertinent site-specific conditions. A summary of how the Executive Officer determined priorities for installation of monitoring wells is provided in Table 5 of Attachment A to the MRP.

What Has Been Done Under the 2007 General Order?

The 2007 General Order established a schedule for Dischargers to develop and implement their Waste Management Plan (WMP) and NMP and required them to make interim facility modifications as necessary to protect surface water and groundwater, improve storage capacity, and improve the facility's nitrogen balance before all infrastructure changes are completed. The 2007 General Order required 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.

How Will This Order Be Enforced?

The State Water Board's Water Quality Enforcement Policy (Enforcement Policy) establishes a process for using progressive levels of enforcement, as necessary, to achieve compliance. It is the goal of the Central Valley Water Board to enforce this order in a fair, firm, and consistent manner. Violations of this order will be evaluated on a case-by-case basis with appropriate enforcement actions taken based on the severity of the infraction and may include issuance of administrative civil liabilities. 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 violators; 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 Dairy 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 Dairy 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.

To date, the Executive Officer has initiated and taken a significant number of enforcement actions against Dischargers for failure to comply with the terms of the 2007 General Order. Such actions have included, but are not limited to issuance of: 770 Notices of Violation; 94 Water Code 13267 investigations; 71 Selective Enforcement Letters; 67 Administrative Civil Liability complaints (Wat. Code, §§ 13385 and 13323.); and 12 Expedited Payment Letters.

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

Central Valley Water Board	Pond Liner Design Requirements
Waste Discharge Requirements General Order No. R5-2013-0122	<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>

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.”

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).

MEMORANDUM

To: Theresa A. Dunham; Somach, Simmons & Dunn

From: John Schaap, Steve Bommelje

Subject: Costs to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons.

Date: August 5, 2013

This memo estimates the costs to retrofit existing dairies that have do not have Tier 1 or Tier 2 lagoons for a range of dairy sizes. It also discusses other cost drivers that could impact retrofit projects.

Qualifications

John Schaap graduated from California Polytechnic State University, San Luis Obispo, California with a B.S. in Agricultural Engineering. He also holds an M.S. in Biological and Agricultural Engineering from the University of California, Davis, California.

Mr. Schaap is a registered agricultural and civil engineer in the State of California (license numbers AG 563 and C 61754). He has been in private practice as a consulting agricultural and civil engineer since January 2001, and has specialized full-time in dairy related matters in the San Joaquin Valley since that time. Mr. Schaap is a principal engineer with Provost and Pritchard Consulting Group (P&P).

Provost and Prichard Consulting Group has been meeting agricultural design and consulting needs in Central California since 1968. We have offices in Fresno, Bakersfield, Visalia, Clovis, Modesto, and Los Banos. Our staff includes licensed agricultural and civil engineers, as well as licensed geologists and other technical staff experienced in dairy work.

P&P acquired the dairy design firms of Valley Management Systems, Inc. (VMS) and EJS & Associates, Inc. in 2004, enfolding key personnel into the company to strengthen our dairy business. Since then, our firm has been at the forefront in assisting dairy clients achieve compliance with new or changing regulatory requirements, for both new and existing facilities.

Within approximately the last 10 years, P&P has designed and assisted in the certification of over 50 dairy lagoons in the Central Valley. These have included approximately 27 sites with lagoons meeting the 10% clay soil requirement, 7 sites that followed the NRCS Appendix 10D compacted clay liner guidelines, 10 sites with single liners, mostly using high density polyethylene (HDPE) material; and 8 sites with double HDPE liners with leachate collection and recovery systems (LCRS). Our firm has many more dairy liner projects that are currently in the design stage. The above projects do not include other similar wastewater impoundments that have been engineered for food processors, wastewater treatment plants, or other similar facilities, going back further in P&P's history. In the last ten years, approximately 14 of our technical staff have worked on lagoon projects.

Cost Estimates

We have prepared a range of cost estimates for retrofitting or rebuilding dairy lagoons with new liners. See Table 1. The estimates are for four sizes of dairies within a range typically found in the Central Valley: 300 milk cows (MC), 750 MC, 1,500 MC, and 3,000 MC. For each herd size we have calculated costs for four possible scenarios. These scenarios represent the four possible combinations of the following variables:

- 1) Liner design: single (Tier 2) or double (Tier 1) liner;
- 2) Lagoon location: new location or build within the current footprint of an existing lagoon location.

In order to keep the analysis consistent through the range of herd sizes, some baseline assumptions were used in sizing lagoons. These include the following:

- Weather conditions found in the Tulare and Kings County area;
- A 5:1 rectangular shape with a total depth of 20 feet;
- A constant rate of dairy barn water generation of 50 gallons per milk cow per day;
- 120 day winter storage period from November 1 to March 1; and,
- Overall storage capacity ratio (actual/required) between 100% and 105%.

Cost estimates assume a completely below ground lagoon with more than 5 feet of clearance to highest anticipated groundwater. Costs for design, earthwork, lining, and construction quality assurance and reporting are included.

Option of Single or Double HDPE Liner Design

The Dairy General Order stipulates that all new or modified lagoons meet the conditions described as a Tier 1 or Tier 2 lagoon. The Tier 1 lagoon is a 60-mil HDPE double liner with a leachate collection and recovery system. The Tier 2 option does not specify the liner material needed; however, it requires groundwater modeling as part of the design, and proposed ongoing monitoring that demonstrates protection of ground water. At this time, when the conditions are such that a single liner is possible, we have found it necessary to design a liner consisting of one layer of 60-mil HDPE over a one-foot thick soil layer with low permeability. Thus, for the Tier 2 case, this is what we have used as the basis of our estimate.

HDPE liner material with proper care and maintenance should have a service life of 20 to 30 years. We have not calculated a life cycle cost, but simply a single installation cost. Dairy facilities can have a useful life that exceeds the liner life, and thus a liner may need to be reinstalled at least once over the useful life of a dairy.

Option of New Location or Existing Location

The existing location option assumes that the size of the current lagoon is adequate, requiring only the excavation of several feet of organic laden soil, and contouring of the side slopes. An existing location requires the removal of liquid and solid manure prior to any construction work. Costs were included for that effort.

The new location option includes estimates for full excavation (assuming stockpiling nearby) and a location within close proximity in order to connect to the existing wastewater system. Here, the cleanout of manure from the old lagoon could be performed at any time but will at some point need to be performed to close the lagoon. If the old lagoon was allowed to dry, the cleanout costs could be reduced by handling the manure in a dry state. So we have included

 Cost to Retrofit Existing Dairies That Do Not Have Tier 1 Or Tier 2 Lagoons

the “liquid and wet solid” cleanout cost in parentheses in Table 1 to provide an understanding of the range of costs that could be expected to clean the old lagoon to close the project.

Table 1. Costs to retrofit lagoons based on dairy size and retrofit type.

	<u>Existing Location*</u>	<u>New Location</u>	<u>Wet Cleanout**</u>
300 MC, 2.1 ac lagoon			
Single	\$198,000	\$180,000	(+\$37,000)
Double	\$270,000	\$252,000	(+\$37,000)
750 MC, 3.4 ac lagoon			
Single	\$300,000	\$275,000	(+\$78,000)
Double	\$425,000	\$399,000	(+\$78,000)
1,500 MC, 6.0 ac lagoon			
Single	\$521,000	\$482,000	(+\$171,000)
Double	\$753,000	\$714,000	(+\$171,000)
3,000 MC, 10.7 ac lagoon			
Single	\$948,000	\$887,000	(+\$357,000)
Double	\$1,383,000	\$1,321,000	(+\$357,000)

* An existing location estimate includes the cleanout of liquid and solid manure from the lagoon before construction can begin.

** A new location estimate does not include any cleanout cost of the old lagoon. This wet cleanout cost could be expected if performed while water is in the old lagoon.

Issues

There are many issues that may arise with the retrofitting or replacement of a lagoon. Each dairy has a different set of circumstances that may require additional effort to be expended in locating and designing a lagoon.

Tier 1 Lagoon (Double Liner) vs. Tier 2 Lagoon (Single Liner)

From the estimated costs shown in Table 1, a single liner appears to be a more cost-effective option. However, to obtain approval for a single liner, the design must show that groundwater will not be impacted via a model, and a monitoring system must be installed and maintained.

Groundwater models that are currently used to predict the performance of a liner are simplified models that are highly conservative. Conditions contributing to passing the modeling are low nitrate levels in background groundwater samples, high velocity groundwater flow beneath the site, low permeability soils, and minimal defects in the post-construction liner.

Currently, we are finding that most sites do not pass the simplified model and a single liner is thus not an eligible option. If a detailed modeling effort were performed, the modeling cost could equal the cost of the extra liner layer in question, without a guarantee of positive results. Thus, detailed modeling is generally not pursued at this time.

A single liner requires some type of accompanying groundwater monitoring, as noted above. Monitoring wells focused around the subject lagoon (outside of the representative monitoring program) are the typical monitoring system proposed. When depth to first encountered water is

great, the cost for installing monitoring wells increases and other groundwater quality influences can possibly be mixed in the samples taken, obscuring the conclusions that can be drawn.

In Table 1 above the single liner option includes costs for installing lagoons, but does not include costs for monitoring. These can include the installation of monitoring wells, sampling and laboratory analysis on an ongoing basis, data assessment and analysis, and technical reports. These costs are not insignificant and can cost tens of thousands of dollars for well installation and hundreds to thousands of dollars per year in ongoing costs.

New Location vs. Existing Location

To rebuild a lagoon in the current location, provisions must be made to divert and contain the daily barn water generation (and any rainfall runoff) temporarily during the construction period. In many cases this may not be feasible, leading to the only other option, to build in a new location.

To compact the soil for structural support and installation of the HDPE liner, the side slopes must typically be 2:1 (horizontal: vertical) or flatter, depending on soil properties. Typical existing lagoon slopes are 1.5:1 or steeper. Therefore a larger lagoon footprint is likely to be needed to maintain the storage volume. In addition, the retrofit will need to provide 5 to 6 feet of additional room around the lagoon perimeter for an anchor trench to hold the liner material. Many lagoons are positioned near other structures on the dairy and this additional space may not be available.

Relocating the lagoon to a new area may require county permit changes if the location is outside of the established footprint of the dairy. Such changes are likely to trigger the need to comply with the California Environment Quality Act (CEQA), which could require the preparation of a mitigated negative declaration or an Environmental Impact Report (EIR). Other land use permits may also be triggered. Additional costs to comply with local land use permitting processes (including CEQA compliance) could possibly ranging between \$30,000 to \$100,000 or more.

The estimates in Table 1 indicate approximately how many acres the new lagoon is expected to occupy. In some cases, locating the new lagoon near the existing lagoon is infeasible and additional costs may be incurred to route the wastewater to a more distant location. In some cases, significant infrastructure, such as a pump station, may be required.

Highest Anticipated Groundwater

In shallow groundwater areas, this can be a significant issue complicating lagoon design. In other areas where the groundwater has deepened, but historically has been within 5 feet of the invert, it can present a physical or regulatory risk.

In order to quantify the highest anticipated groundwater to plan lagoon construction, areas with shallow groundwater require study on factors influencing the groundwater level, including influences from irrigations, ditches, or rainfall. This could require a complete year of study, periodically recording depth to groundwater in the intended site area, followed by a report from a geologist documenting the findings and recommendations. Conclusions may dictate reducing lagoon depth, building an above ground lagoon, and/or artificially controlling the water table with a tile drainage system.

Above Ground Lagoon

The above ground lagoon can be a good option for a new lagoon, from the perspective of minimizing the volume of soil that must be moved. However, in many areas, these are required due to high groundwater conditions.

Depending on the available soils, embankment height may be limited by engineering constraints. If below grade depth is limited, a deep lagoon (and efficient use of liner area) may not be possible at all. For a given storage volume, decreasing the depth of the lagoon will require increasing the footprint and corresponding liner costs. Thus, the cost for an above ground lagoon could be higher than identified in Table 1, as a function of the depth of the lagoon. There could be a decrease in earthwork costs, as less total volume of earth may need to be moved to provide the same storage volume; however, this is offset by the increased cost of placement of compacted fill in above ground embankments.

Using the 750 milk cow dairy case as an example, an above ground lagoon with only 12 feet of total depth increases the foot print by 1.2 acres and adds an additional cost of approximately \$34,000 to the single liner and \$83,000 for the double liner installation.

Manure and Sand Separation

New lagoons lined with thin layers of synthetic material are vulnerable to damage from lagoon cleaning equipment. A small hole in the liner can allow wastewater to get underneath. The wastewater naturally produces carbon dioxide and methane, byproducts of anaerobic digestion. The trapped gases under the liner can accumulate (if not vented) and eventually tend to float the liner to the surface, introducing stresses in the liner, leading to more liner damage, more wastewater under the liner, and yet more trapped gases. Thus, a minor nick or puncture of a 60 mil layer can lead to a major incident, requiring the replacement of the entire liner. Costs could approach what is estimated in Table 1 for an existing lagoon relining operation. Accordingly, it is very important to minimize liner exposure to equipment and to reduce cleanings as much as possible.

Manure solids separation systems are common on dairies. Some systems still allow a significant amount of solids into the lagoon because of various issues. Good solids separation can be an important factor enhancing the useful life of a liner. Thus, when installing a lined lagoon it is important to consider or reconsider manure separation. Adding a new screen separator and concrete drying pad can cost from \$180,000 for a smaller dairy to \$400,000 or more for a larger dairy. These costs are not included in Table 1 but may be necessary on many dairies to properly maintain and operate lagoons with synthetic liners.

Sand or dirt removal is also an important consideration. Sand can be introduced to the manure stream from bedding, feed, track-in from corrals, or other sources. Sand settling lanes or traps are a good solution, but must be considered during design to account for location, elevation, and gravity flow constraints.

Increased Rainfall and Storage Period

The estimates in Table 1 considered the weather conditions representative within Kings and Tulare Counties. Other areas to the north have more rainfall and may require a longer storage period, both of which require additional storage volume. Providing greater storage volume results in increased costs over what was estimated in Table 1.

Using the 750 milk cow dairy again, changing the rainfall numbers to what is expected in the northern Sacramento Valley near Orland, the 750 milk cow dairy needs an additional 1.7 acres and costs are increased by roughly 50%. Adding an additional month of storage adds approximately another 7% to the cost.

Conclusion

The estimated costs provided in Table 1 are based on the minimum anticipated cost for the construction of an HDPE lined lagoon for a range of dairy sizes. These estimates are conservative (at an estimated higher cost) based on standardized assumptions that were outlined. However, when compared to each unique dairy situation additional cost drivers can easily increase the overall cost. These additional costs outlined in the Issues section can include location, groundwater conditions, manure and sand separation systems, higher rainfall areas than the south valley, and the length of the storage period.



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MEMORANDUM

To: Theresa A. Dunham; Somach, Simmons & Dunn
From: Annie AcMoody
Subject: Financial Impact to Retrofit Dairies that Do Not Have Tier 1 or Tier 2 Lagoons
Date: August 6, 2013

This memo estimates the financial impact to retrofit existing dairies that do not have Tier 1 or Tier 2 lagoons for a range of dairy sizes.

Scope/methodology

No two California dairies are exactly alike; dairy operators have different resources and production facilities. Therefore, this report provides a range of financial impacts. The estimated costs to retrofit dairy lagoons were based on an analysis provided by Provost and Pritchard (P&P). See memorandum from P&P dated August 5, 2013.

Specific farm financial information was compiled using California Department of Food and Agriculture (CDFA) data. The Cost of Production Unit, within the Dairy Marketing Branch of the CDFA, compiles cost of producing milk on a quarterly basis and publishes yearly averages for each of the production regions in California. More specifically for this analysis, a sample of dairies within California's Central Valley was used for each of the size categories analyzed by P&P.

Assumptions regarding the financing of the projects were made after interviewing personnel from three different lending institutions.

Due to market place volatility, it is extremely difficult to forecast dairy margins with any accuracy. One more reliable way is to look at past recent market conditions. The last five years presented an array of market conditions and provide insight on the financial situation faced by California dairy farmers. Assuming upcoming years are filled with similar extremely variable conditions, allows for an analysis of different scenarios.

Qualifications

Annie AcMoody graduated from Universite Laval, Quebec, Canada with a B.S in Agricultural Economics and Management. She also holds an M.S. in Agricultural Economics from Purdue University, West Lafayette, Indiana. Mrs. AcMoody has been the director of economic analysis for Western United Dairy Men (WUD) since 2010. She has been an agricultural economist focusing on dairy economics issues in the state of California since 2007. More specifically, prior to working at WUD, she was an economist at the California Department of Food and Agriculture's Dairy Marketing Branch. In that role, she frequently analyzed the financial health of the California dairy industry, both from the dairy producers' and manufacturers' perspectives.

Dairy production in California

Milk and associated dairy products (cheese, dry milk powder, butter, ice cream, etc.) are California's top grossing agricultural products. Based on a study commissioned by the California Milk Advisory Board, California's dairy industry supported 450,000 jobs and generated \$63 billion in economic impact statewide in 2008. Nationally, California's production is significant: in 2012, California led the nation in milk production, producing 21% of the U.S.'s milk supply.

In recent years, milk price volatility has become a part of dairy operators' reality. The large variation in estimated margins over the past five years is a clear illustration of that. 2009 was especially negative as dairy operators in California were faced with historically low prices for milk and unusually high cost of production. Costs of production have remained high, fueled notably by high feed costs that remain supported by the government's ethanol policies. The margins outlined in this document do not include the cost of compliance with environmental regulations, which are becoming an increasingly larger part of the cost of producing milk in California. Each year, dairies have been forced out of business. The net loss of dairy operations over the past five years totaled 387 farms. This data does not include the number of farmers forced out of business and whose dairies were acquired by another dairy operation that managed to stay in business.

California dairies are complex and advanced operations. Nearly all California dairies are family run, and the farmers strive for production efficiencies through the use of advanced technologies in genetics, nutrition, reproduction, animal housing, and animal welfare.

Data

1) Cost of production

To calculate the impact of retrofitting dairy lagoons, data from the CDFA Cost of production studies were used. Those studies are conducted quarterly. CDFA staff goes to dairies and gather actual financial information. A sample representing approximately 10% of the dairy farms in California is analyzed each year to provide a representative picture of the financial health of the state's dairy operations (cost of production studies can be found at: http://cdfa.ca.gov/dairy/dairycop_annual.html). In this financial impact study, data from that sample was analyzed. More specifically, dairies representative of the sizes used in the P&P study were studied (300 cows, 750 cows, 1,500 cows and 3,000 cows).

CDFA releases a cost of production that includes allowances (return on investment and return on management). Because the return on investment is an allowance that can be foregone if the dairy operation is in a dire situation, it was not included in the cost of production number for the purpose of this analysis.

The cost of retrofitting dairy lagoons was analyzed under four different scenarios. Because the "new location" without assuming a wet clean-up cost was the cheaper option, it was used for a low end estimate. Utilization of both single and double liners was analyzed. The "new location" with wet clean-up cost is the most expensive option; therefore it was used as the most expensive end of the range for analysis purposes. Both single and double liners were also analyzed. From these four scenarios, specific yearly costs to the dairy were calculated using financing assumptions (repayment estimates included in Appendix A).

2) Revenue

Dairy operations' revenues come from the milk check they receive each month. In California, there is a milk pricing system that guarantees a minimum price processors are required to pay. However, each dairy ends up getting a different price due to different milk components, premiums, marketing costs, etc. Therefore, the mailbox price, which represents the net price received by a dairy, was used to determine the dairy revenue for each farm in the sample.

3) Financing

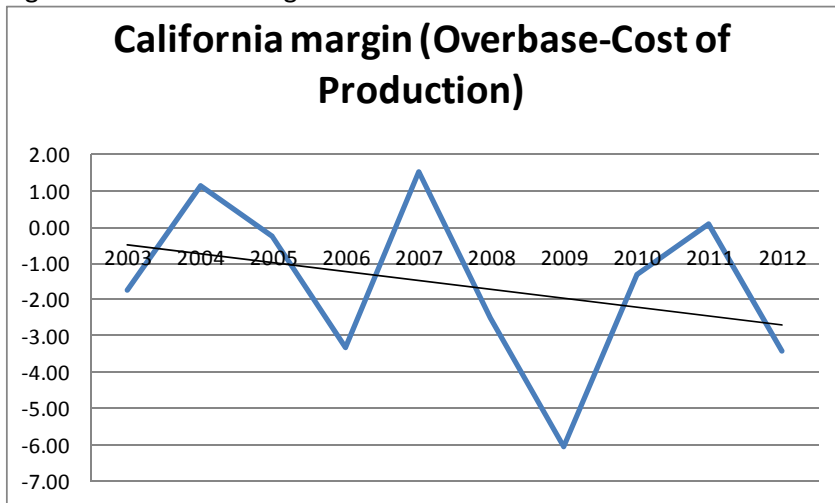
Because the cost of retrofitting dairy lagoons is significant, dairies would have to secure financing to pay for the project. The lack of available credit for dairy operations has been a popular topic in recent years and will be discussed in the Impact section further. For the sake of this study, it was assumed the dairy operation was able to secure a loan. But it is debatable whether a dairy would be able to secure a loan to proceed with the project because retrofitting a dairy lagoon does not create new value on the farm. Therefore, collateral, free of liens, would need to be available. Although some banks would rather lend on a shorter time frame, a twenty year loan seems to be a conservative option, lower yearly cost option and was used as an assumption. The current going interest rate for those terms is 6%.

Impact to dairies

1) Financial impact

Over the last decade, dairies have had to weather various pricing conditions, with some positive and some negative margin years. However, the overall trend is one of declining margins. A quick glance at the overbase price (minimum milk price paid producers) minus the cost of production (including allowances) illustrates that point (see Figure 1).

Figure 1: California margin



The bottom line experienced by dairies of the sizes outlined in the P&P memorandum did not exhibit a different trend during the past five years. 2008 and 2009 were not profitable years and forced dairies to dig into their equity to stay afloat (2008 for the 1,500 cow herd sample was an exception). 2010 and 2011 were profitable years while 2012 was not. Table 1 illustrates the net revenue per cow for each herd size.

Table 1: Net Revenue per Cow

Herd Size	2008	2009	2010	2011	2012
300	\$ (89.74)	\$ (891.12)	\$ 52.11	\$ 396.30	\$ (321.12)
750	\$ (33.26)	\$ (745.69)	\$ 175.36	\$ 364.25	\$ (309.39)
1500	\$ 98.59	\$ (840.59)	\$ 195.37	\$ 622.35	\$ (117.88)
3000	\$ (51.19)	\$ (747.42)	\$ 265.71	\$ 746.33	\$ (139.97)

Overall, for the past five years, dairy operations have fallen behind as the average net revenue per cow was negative for all herd sizes but one (see Table 2).

Table 2: Net revenue per cow, five year average

Average net revenue per cow				
Herd size	300	750	1500	3000
Past five year:	\$ (170.71)	\$ (109.75)	\$ (8.43)	\$ 14.69

Looking at this data clearly explains the declining trend in the number of dairy operations in California. Left with no financial room to maneuver, adding on the cost of retrofitting dairy lagoons would prove impossible for most operations. The negative margins resulting are evidence of how much more economically fragile dairy operations would be if the costs of retrofitting lagoons were to be imposed on them. In no analyzed scenarios were dairies profitable with the added costs. Figure 2 illustrates that point. Table 3 after shows a more detailed analysis for each year and herd size.

Figure 2: Average net revenue per cow

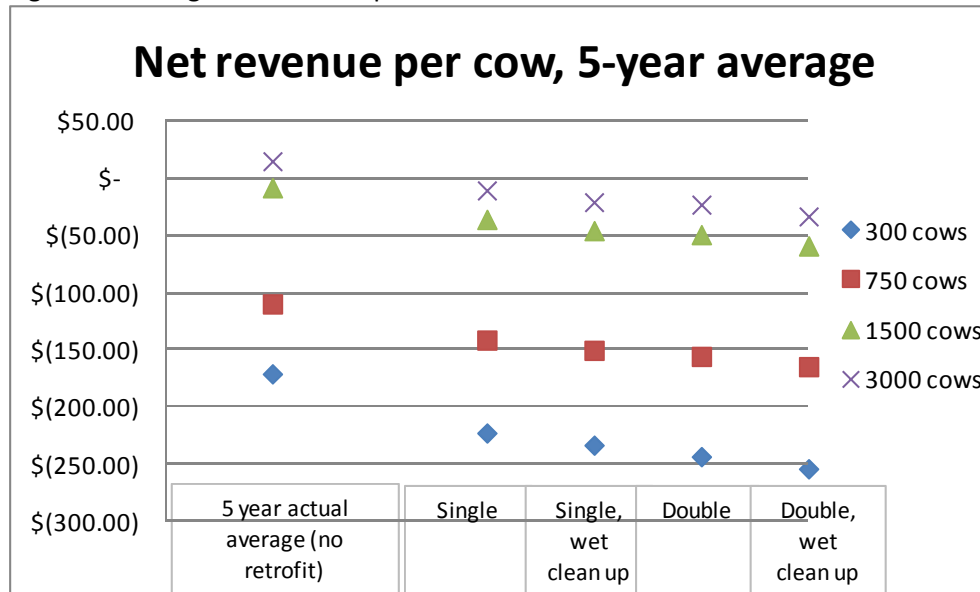


Table 3: Yearly margins by herd size based on four different costs scenarios

300	2008	2009	2010	2011	2012
Single liner	\$ (141.32)	\$ (942.70)	\$ 0.52	\$ 344.72	\$ (372.71)
Single, wet clean up	\$ (151.92)	\$ (953.30)	\$ (10.08)	\$ 334.11	\$ (383.31)
Double liner	\$ (161.95)	\$ (963.33)	\$ (20.11)	\$ 324.08	\$ (393.34)
Double, wet clean up	\$ (172.55)	\$ (973.94)	\$ (30.71)	\$ 313.48	\$ (403.94)
750	2008	2009	2010	2011	2012
Single liner	\$ (64.79)	\$ (777.21)	\$ 143.83	\$ 332.72	\$ (340.91)
Single, wet clean up	\$ (73.73)	\$ (786.16)	\$ 134.89	\$ 323.78	\$ (349.85)
Double liner	\$ (79.00)	\$ (791.43)	\$ 129.62	\$ 318.51	\$ (355.13)
Double, wet clean up	\$ (87.94)	\$ (800.37)	\$ 120.68	\$ 309.57	\$ (364.07)
1500	2008	2009	2010	2011	2012
Single liner	\$ 70.96	\$ (868.22)	\$ 167.75	\$ 594.72	\$ (145.51)
Single, wet clean up	\$ 61.16	\$ (878.02)	\$ 157.95	\$ 584.92	\$ (155.31)
Double liner	\$ 57.67	\$ (881.52)	\$ 154.45	\$ 581.42	\$ (158.81)
Double, wet clean up	\$ 47.87	\$ (891.32)	\$ 144.65	\$ 571.62	\$ (168.61)
3000	2008	2009	2010	2011	2012
Single liner	\$ (76.60)	\$ (772.84)	\$ 240.29	\$ 720.91	\$ (165.39)
Single, wet clean up	\$ (86.83)	\$ (783.07)	\$ 230.06	\$ 710.68	\$ (175.62)
Double liner	\$ (89.04)	\$ (785.27)	\$ 227.86	\$ 708.47	\$ (177.82)
Double, wet clean up	\$ (99.27)	\$ (795.51)	\$ 217.63	\$ 698.24	\$ (188.06)

2) Availability of credit

In conversations with lenders, the financing of the retrofitting projects would be difficult for most operations. To qualify for a real estate secured term loan covering the capital expenses amortized over 20 years, the loan would need to be secured by a 1st priority lien with a maximum debt against the appraised value of the real estate of 65%; this may cover 100% of the expenses or only a portion depending on the available lendable equity of the property. The borrower would need to have a debt-service coverage ratio (for all debt) of 1.25x.

If the dairy lagoon is retrofitted, the value of the dairy would most likely not change, i.e. the dairy's value would not increase because the retrofit was performed. Further, to obtain credit, the dairy likely needs to be free and clear of liens to have equity available. Due to the low profitability in the dairy industry over the past 5 years (as outlined in the previous section), facility values have been discounted heavily. One positive that the aforementioned analysis does not take into account is that farm-land values have appreciated greatly. However, this appreciation may not be sustainable and that appreciation is typically for a highest and best use of something other than growing forage crops to feed cows. It is generally tied to permanent plantings with most of the influence coming from nuts such as almonds, walnuts and pistachios.

Conclusion

A dairy lagoon retrofit would increase the overhead and breakeven cost to the operation. This increased cost of production, because it is not revenue generating, cannot be passed on to the processor or consumer so it reduces the profitability of the dairy. Ultimately, these costs could be the final add-on that may put a dairy operation out of business. Further, a large percentage of dairy operations would not be eligible for financing to complete a retrofit due to the lack of repayment capacity and because the operation is already likely over leveraged with existing debt.

Appendix A

TERMS OF LOAN

Life of loan (years) 20
 Payments per year 12
 Annual interest rate 6.00%

	New location, no clean up cost, Single liner	New location, wet clean up cost, Single liner	New location, no clean up cost, Double liner	New location, wet clean up cost, Double liner
300 MC				
PRINCIPAL	\$ 180,000.00	\$ 217,000.00	\$ 252,000.00	\$ 289,000.00
Monthly Payment	\$ 1,289.58	\$ 1,554.66	\$ 1,805.41	\$ 2,070.49
750 MC				
PRINCIPAL	\$ 275,000.00	\$ 353,000.00	\$ 399,000.00	\$ 477,000.00
Monthly Payment	\$ 1,970.19	\$ 2,529.00	\$ 2,858.56	\$ 3,417.38
1500 MC				
PRINCIPAL	\$ 482,000.00	\$ 653,000.00	\$ 714,000.00	\$ 885,000.00
Monthly Payment	\$ 3,453.20	\$ 4,678.29	\$ 5,115.32	\$ 6,340.41
3000 MC				
PRINCIPAL	\$ 887,000.00	\$ 1,244,000.00	\$ 1,321,000.00	\$ 1,678,000.00
Monthly Payment	\$ 6,354.74	\$ 8,912.40	\$ 9,464.05	\$ 12,021.71

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Existing Milk Cow Dairies

WATER BOARD WEBSITE AT http://www.waterboards.ca.gov/centralvalley/available_documents/index.html#confined. 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. R5-2013-0122.

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) _____

(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 COOPERATION WITH THE CENTRAL VALLEY WATER BOARD, THE UNIVERSITY OF CALIFORNIA, WESTERN UNITED DAIRYMEN, THE CALIFORNIA DAIRY CAMPAIGN, AND THE MILK PRODUCER'S COUNCIL.

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. R5-2013-0122, 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. R5-2013-0122 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. R5-2013-0122 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			

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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:

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- 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. R5-2013-0122 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;

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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. R5-2013-0122;
 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. R5-2013-0122.
- 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. R5-2013-0122.

- 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. R5-2013-0122;
 - 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;

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- 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. R5-2013-0122.

ATTACHMENT C

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

Waste Discharge Requirements General Order R5-2013-0122 (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 R5-2013-0122. 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 R5-2013-0122, 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 E.3 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 E.5 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 J.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 R5-2013-0122."*

5. Land Application Specification E.6 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 E.8 of the Order: *“All process wastewater applied to land application areas must infiltrate completely within 72 hours after application.”*
7. Land Application Specification E.9 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 G.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 E.7 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 shall not result in the creation of a condition of pollution or nuisance¹.”*
- 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.”*

¹ In an emergency, guidance is provided by the CAL/EPA Emergency Animal Disease Regulatory Guidance for Disposal and Decontamination (October 20, 2004).

- F. Land Application Specification E.4 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 E.8 of the Order: *“All process wastewater applied to land application areas must infiltrate completely within 72 hours after application.”*
- H. Land Application Specification E.9 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. General Specification B.7 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 R5-2013-0122, 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 R5-2013-0122.

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 default 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): _____

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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 E.3 of Reissued Waste Discharge Requirements General Order No. R5-2013-0122) 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 California Code of Regulations, title 27, 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.

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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 Reissued Waste Discharge Requirements General Order R5-2013-0122.
13. "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.
14. "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.
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 filed in response to the 2005 Report of Waste Discharge Request Letter) 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 Reissued Waste Discharge Requirements General Order R5-2013-0122 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 Reissued Waste Discharge Requirements General Order R5-2013-0122.
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 Water Code section 13050(m) 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 Water Code section 13050(l)(1) 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 , barns, milk houses, corrals, milk parlors, manure and feed storage areas, process water conveyances and any other area of the dairy facility that is not the land application area or the ponds.
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 Water Code section 13050 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
ETo	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

Reissued Waste Discharge Requirements General Order No. R5-2013-0122
Existing Milk Cow Dairies

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