STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL

BOARD ORDER WQ 2026-0028

IN THE MATTER OF REVIEW OF
WASTE DISCHARGE REQUIREMENTS GENERAL ORDER NO R5-2013-0122
FOR MILK COW DAIRIES IN THE CENTRAL VALLEY REGION ISSUED BY THE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
CENTRAL VALLEY REGION

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BY THE BOARD:

In this order, the State Water Resources Control Board (State Water Board or Board)[1] reviews Order R5-2013-0122, Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies (2013 Dairy General WDRs), issued by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) on October 3, 2013. The 2013 Dairy General WDRs authorize discharges of waste from existing milk cow dairies to waters of the state within the Central Valley region and set forth numerous requirements for monitoring, reporting, implementation, and evaluation of waste management practices.

For reasons discussed below, the State Water Board concludes that the 2013 Dairy General WDRs should be remanded to the Central Valley Water Board for reconsideration and revisions, as directed herein and as otherwise appropriate. It is important to recognize at the outset of our discussion that, not only does this order address issues raised in a petition seeking State Water Board review of the 2013 Dairy General WDRs[2] at Section II, it also establishes a new regulatory framework for nitrogen discharges from milk cow dairies (referred to in this order as "dairies" for simplicity) for the next iteration of the Central Valley Water Board's general waste discharge requirements for dairy manure[3] discharges to groundwater (hereafter referred to as the revised dairy general waste discharge requirements) at Section III, on our own motion.[4] The scope of the regulatory framework is limited to issues concerning nitrogen

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[1] Board Member D'Adamo and former Board Member Firestone have been recused from involvement in this proceeding.

[2] The petition for review of the 2013 Dairy General WDRs filed by Asociación de Gente Unida por el Agua and Environmental Law Foundation is discussed at Section I.E.

[3] For purposes of this order, the term dairy manure refers to the solid and liquid waste that is produced by a dairy (primarily cow feces and urine, and other commingled materials including bedding, wasted feed, washdown water, process wastewater and precipitation) that is typically stored in retention ponds and often eventually applied to cropland to produce feedstock for the dairy herd. While manure has many beneficial attributes when properly managed and used as a fertilizer for crops, discharges of manure that can affect the quality of waters of the state are regulated as a waste by the Water Boards under the Porter-Cologne Water Quality Control Act. (Wat. Code, § 13000 et seq.)

[4] Although we considered making several of the regulatory framework's requirements precedential for some of the milk cow dairies that are under the jurisdiction of the other

discharges to groundwater, and leaves other dairy discharge issues not addressed by this order to the discretion of the Central Valley Water Board. It should be emphasized that we intend that the new regulatory framework for nitrogen discharges apply not only to existing dairies enrolled in the 2013 Dairy General WDRs, but to all dairies subject to the Central Valley Water Board's authority, including but not limited to dairies that have commenced operation or consolidated or expanded since the Central Valley Water Board's adoption of the 2013 Dairy General WDRs, dairies that may commence operation, consolidate, or expand in the future, and dairies that utilize anaerobic digesters or co-digesters,[5] except as expressly provided in this order.

We are establishing the new regulatory framework for nitrogen discharges primarily because of our evolving understanding of the outsized contribution of dairies to groundwater nitrate pollution in the Central Valley compared to other sources of

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regional water quality control boards (regional water boards), we conclude that we should focus on dairies within the Central Valley before determining whether to require that the regulatory framework's requirements be implemented for milk cow dairies outside of the Central Valley—and potentially other confined animal facilities, as well. We conducted a spatial analysis using publicly available dairy facility location data retrieved from the California Integrated Water Quality System (CIWQS) and nitrate risk information from the State Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) Aquifer Risk Map (ARM). The analysis identified and mapped dairy facilities that are located within one mile of areas classified as high-risk for groundwater nitrate contamination. This was accomplished by extracting active, state-regulated animal feeding facilities from CIWQS, isolating mature dairy operations, and overlaying these point locations with ARM nitrate high-risk identified in one square mile areas. A one-mile buffer was applied to capture potential groundwater movement beyond the boundaries of mapped high-risk areas. The results showed that, out of all the dairies in California that are within one mile of a nitrate high-risk area, approximately 94 percent of the dairies are within the Central Valley. (See Map of Dairies in California within One Mile of a High-Risk Nitrate Area at <https://waterboards.ca.gov/public_notices/petitions/water_quality/r5-2013-0122.html> (as of Aug. 22, 2026.).) As a result, we are for now leaving it to the discretion of the regional water boards to decide whether to apply the same or similar regulatory approaches for other confined animal facilities. In the meantime, we are committed to assisting regional boards where any of these confined animal facilities appear to be posing a threat to groundwater drinking water supplies. State Water Board staff will utilize our various drinking water programs and engage directly with those regional boards to ensure affected residents are provided with information and access to alternative drinking water supplies.

[5] See, e.g., Central Valley Water Board Order Nos. R5-2010-0130 and R5-2011-0039.

nitrogen loading, as well as the relative amount of nitrogen loading to groundwater from the different sources of dairy manure discharged from dairies. As discussed in Section I.B, and due in part to data collected in response to the 2013 Dairy General WDRs, we are learning how the dairy industry's manure management practices are responsible for a significant portion of the nitrogen loading to groundwater in the Central Valley. In addition, it is now generally acknowledged that the practice of applying manure (and, in some cases, other types of nitrogen-containing fertilizer) to dairy croplands, commonly referred to as land application, is responsible for the vast majority of dairies' nitrogen impacts to groundwater quality—a consequential departure from previous assumptions that the greatest nitrogen loading to groundwater is from seepage of dairy manure stored in earthen lagoons, referred to herein as manure retention ponds.

The extensive over-application of dairy manure to dairy cropland by many dairies—and the resulting impacts to the groundwater and the communities that rely on the groundwater—has forced us to take a hard look at what we now recognize has been an inadequate overall approach for regulating manure discharges from dairies. In particular, we conclude that, going forward, it is appropriate to adopt a different approach for the application of manure to dairy cropland. Although land application of manure to dairy cropland is clearly instrumental in producing feedstock for the dairies' herds, the excessive amount of manure that is applied to dairy croplands strongly indicates that land application has largely been treated as a method of disposing the manure generated by the dairy. As a result, a major part of the new regulatory framework focuses on developing new requirements that will ultimately restrict dairies' land application of manure to levels that correlate directly to not causing or contributing to concentrations of nitrate that exceed the safe drinking water nitrate water quality objective of 10 mg/L in groundwater designated with the municipal and domestic supply beneficial use.[6]

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[6] When concentrations of nitrogen compounds (e.g., nitrate, nitrite, ammonium) are discussed in this order in units of measurement, the mass is expressed as the mass of nitrogen (N) (e.g., mg/L nitrate as nitrogen), which reflects the nitrogen portion of the molecule and is the standard reporting convention for nitrogen compound concentrations. Therefore, any reference in this order to nitrate concentrations uses nitrate as nitrogen (nitrate-N), including references to the nitrate water quality objective

We acknowledge that government pricing mechanisms for dairy commodities prevent dairies from simply raising their prices to pay for necessary investments in dairy manure management improvements. We further recognize that we need to develop a more precise understanding of the fate and transport of dairy manure discharges to groundwater, and that the dairy industry and its partners need to continue to develop technological and market improvements to facilitate the distribution and use of dairy manure for off-site use as a fertilizer, soil amendment, and other purposes on a significant scale to adequately address the issue. Some of this work has already commenced under the leadership of the California Department of Food and Agriculture.

However, as we discuss in Sections I.B and I.H, we now know that dairies are a major contributor to the widespread nitrate groundwater contamination and many rural households in the Central Valley are negatively impacted with nitrate-contaminated drinking water, resulting in severe health, economic, and quality-of-life impacts. We must shift the paradigm: Instead of continuing to allow the dairy industry to apply manure to dairy croplands at rates that lead to groundwater quality impacts, the dairy industry needs to transition to modern and sustainable manure management practices. Dairy manure is and should be recognized as a valuable and beneficial byproduct that has multiple potential uses, including application as a fertilizer to dairy croplands and other agricultural lands at rates that are protective of groundwater quality and the communities that rely on that groundwater.

The transition will require substantial effort and time. With our contribution, support, and oversight, the Central Valley Water Board's revised dairy general waste discharge requirements will, consistent with our new regulatory framework, take significant steps toward ultimately requiring dairies to make fundamental operational changes to cease causing or contributing to concentrations of nitrate in groundwater that exceed the safe drinking water nitrate water quality objective of 10 mg/L.

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of 10 mg/L. While some nitrogen compounds may be reported as their total molecular ions (nitrate, nitrite, or ammonium), the individual molecular ion units are chemically convertible but not numerically equivalent to the nitrogen portion. Using the standard reporting unit of nitrogen creates a consistent basis for comparison, allowing one to track nitrogen as it transforms from one compound to another.

While this order establishes a regulatory framework that applies only to dairies in the Central Valley Water Board, Section II.B.1 of this order also provides precedential guidance for all regional water boards regarding the appropriate interpretation and application of State Water Board Resolution No. 68-16, the Statement of Policy with Respect to Maintaining High Quality Waters of the State (the Antidegradation Policy).

In the sections that follow, we begin by setting forth the procedural and chronological background of the 2013 Dairy General WDRs at Section I, starting with brief descriptions of the dairy industry and its water quality impacts and the history of the 2013 Dairy General WDRs, including the court case to which the 2013 Dairy General WDRs in part responds, and the petition for our review of the 2013 Dairy General WDRs that was the initial catalyst for this order. From there we summarize other developments, including intervening actions by the State Water Board and the Central Valley Water Board that have some bearing on the matter before us. We then turn to the significant issues raised in the petition at Section II and, finally, at Section III we describe the new regulatory framework to be used by the Central Valley Water Board in its development of the revised dairy general waste discharge requirements.

I. FACTUAL AND PROCEDURAL BACKGROUND

A. The Dairy Industry

The dairy industry is an important part of California's agricultural economy. It is estimated that 89 percent of the state's cows and 81 percent of the state's dairy farms are located in the Central Valley region. 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, approximately one-fifth of the nation's milk supply that year. California's dairy industry is a vital component of the economy in the Central Valley. Dairies 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, transporters of feed, milk and dairy products, and many others.[7]

[7] 2013 Dairy General WDRs, Information Sheet, pp. IS-19 to IS-20.

B. Dairy Manure

One dairy cow produces approximately 120 pounds of solid manure and 36 pounds of liquid manure daily; consequently, the smallest dairies produce thousands of pounds of manure daily and the largest produce over one million pounds.[8] Because Central Valley dairy cows excrete approximately one pound of nitrogen and 1.29 pounds of inorganic salts in solid and liquid manure daily, a 1,000-cow dairy generates approximately 365,000 pounds of nitrogen and 470,000 pounds of inorganic salts every year.[9]

Dairy solid and liquid manure contain high concentrations of salts and nutrients (including nitrogen compounds, e.g., nitrate, nitrite, ammonium, and organic nitrogen, phosphorus, and potassium compounds). Dairy facilities require regular storage for manure generated onsite. Dairies also generate process wastewater[10] from cleaning activities.

The water quality impacts from dairies' manure management practices are now much clearer. A 2017 study by University of California, Davis (hereafter the UCD 2017 Study) concluded that agricultural lands, including dairy croplands, are the largest contributor of nitrate to groundwater in the Central Valley.[11] Synthetic fertilizer is the largest source of nitrogen to agricultural lands accounting for nearly sixty percent of all nitrogen fluxes to agricultural lands.[12] The second largest source is dairy manure at nearly twenty percent.[13] At the time of the UCD 2017 Study, dairy manure accounted for

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[8] *Asociacion de Gente Unida por el Agua v. Central Valley Regional Water Quality Control Bd.* (2012) 210 Cal.App.4th 1255, 1259 (hereafter *AGUA*).
[9] 2013 Dairy General WDRs, Information Sheet, p. IS-25.
[10] *Id*., Attach. A, p. A-3; Information Sheet, pp. IS-7; Attach. E, p. E-5, item 36.
[11] Thomas Harter et al., *Nitrogen Fertilizer Loading to Groundwater in the Central Valley*, Final Report to the Fertilizer Research Education Program, Projects 11-0301 and 15-0454, California Department of Food and Agriculture and University of California, Davis (Aug. 2017) (hereinafter cited as *Harter, Final Report*), p. 9 at <https://ucanr.edu/sites/default/files/2025-04/FREP%2011-0301%202016%20Final%20Report%202017-10-30.pdf> (as of Aug. 22, 2026).
[12] *Id*., p. 166.
[13] *Ibid*.

fully one-third of the total nitrogen applied to agricultural lands in the San Joaquin Valley and the Tulare Lake Basin.[14]

The UCD 2017 Study also indicates that the highest potential loading rates for nitrogen to groundwater are associated with the crops most intensively fertilized, and particularly with those crops that typically receive dairy manure (i.e., corn, sorghum, sudangrass, cotton, miscellaneous other field crops, and grain and hay).[15] Dairies grow forage crops (including corn silage, sorghum, and grain) exclusively, whereas traditional agricultural farms grow a wider variety of crops. As an example of a crop that is both intensively fertilized and typically receives dairy manure, the California Department of Food and Agriculture's (CDFA) Fertilizer Research and Education Program (FREP) recognizes the nitrogen requirements for corn silage, a major commodity commonly grown by dairies as a summer forage crop,[16] as one of the highest, with nitrogen uptake requirements between 200 to 275 pounds of nitrogen per acre, depending on plant population and previous crop for a grain yield of approximately 180 to 210 bushels per acre and silage yield of 28-33 tons per acre,[17,18] with FREP's nitrogen application recommendations taking into account nitrogen applied and background soil nitrate levels.

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[14] *Id*., p. 109.
[15] *Id*., p. 165.
[16] CVDRMP Summary Representative Monitoring Report, § 2.3.3., p. 42.
[17] California Crop Fertilization Guidelines at <http://www.cdfa.ca.gov/is/ffldrs/frep/FertilizationGuidelines/Corn.html#:~:text=Application%20Rate,-When%20losses%20are&text=Therefore%2C%20for%20a%20grain%20yield,N%20and%20soil%20derived%20N> (as of Aug. 22, 2026).
[18] These FREP nitrogen recommendations for corn silage are based on Brittan's 2004 guidance: Brittan, K. (2004), *2003 Yolo/Solano/Sacramento field corn production*, at <https://corn.ucanr.edu/files/216211.pdf> (as of Aug. 24, 2026). These recommendations are in line with a 1978 study carried out by the University of California, Davis, where an average grain yield of 225 bushels per acre (6.3 tons per acre) of corn grain was produced with 200 pounds of nitrogen per acre. (Arjal, Prato, and Peterson, 1978, *Response of corn to fertilizer, plant population, and planting date* (March 1978) 32 Cal. Agric. 14.) CDFA acknowledges that little recent data about optimal N application rates for corn production exists. Additionally, the findings represent the nitrogen required for plant uptake but may not represent the total nitrogen applied. The findings of the FREP recommendations and the 1978 study highlight the potential need for localized testing on dairy cropland.

For comparison, wheat, another major commodity commonly grown by dairies as a winter forage crop, has a nitrogen requirement between 150 to 200 pounds of nitrogen per acre for a yield of 4 to 4.6 tons per acre in fields where the residual soil nitrate in the top foot of the profile ranged from 30 to 80 pounds of nitrogen per acre at planting, with FREP's nitrogen application recommendations taking into account other sources of background nitrogen levels.[19] By contrast, the UCD 2017 Study estimated average annual application rate of manure nitrogen applied on dairy cropland in the Central Valley is 890 pounds per acre.[20] Although dairy farmers in California commonly grow two to three crops at different seasons throughout a year in the same field, the estimated average annual land application rate of manure nitrogen applied by dairy farmers continues to significantly exceed the crops' nitrogen requirements. Dairy croplands receiving manure may also receive synthetic fertilizer applications, irrigation water nitrate application, and atmospheric deposition of nitrogen. Nitrogen loading to groundwater associated with dairy forage crops likely accounts for a disproportionate share of the total loading of nitrogen to groundwater in the Central Valley.[21]

In 2007-2008, approximately 400,000 acres (including both dairy cropland and traditional agricultural lands) of the Central Valley region was dedicated to growing dairy crops using dairy manure.[22] By comparison, the total irrigated crop acres across the Central Valley region was estimated to be 5,500,000 acres for the 2025 water year. [23]

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[19] California Department of Food and Agriculture, California Crop Fertilization Guidelines at <https://www.cdfa.ca.gov/is/ffldrs/frep/FertilizationGuidelines/> (as of Aug. 22, 2026).

[20] *Id.*, p. 112.

[21] *Harter, Final Report, supra*, p. 134 ("The high [ratio of nitrogen applied to nitrogen removed] for corn, sorghum, and sudan … is particularly concerning due to the large harvest rate, which means that the absolute amount of potential groundwater nitrogen loading may be particularly high in these dairy forage crops.")

[22] Kern River Watershed Coalition Authority *Comprehensive Groundwater Quality Management Plan–Annual Status Report: 2019 Calendar Year* (Aug. 2020), pp. 20-21 at <https://krwca.org/wp-content/uploads/2022/10/krwca-cgqmp-asr-2019.pdf> (as of Aug. 22, 2026).

[23] California State Water Resources Control Board (Nov. 17, 2025), 2024-25 Performance Report: Irrigated Lands Regulatory Program at <https://www.waterboards.ca.gov/about_us/performance_report_2425/regulate/irrigated_lands.html> (as of Aug. 22, 2026).

While these acreages are estimates and not directly comparable, they indicate that the total number of acres of dairy cropland is likely not more than one tenth of the total number of acres of traditional farms in our irrigated lands regulatory program in the Central Valley. Yet, as stated above, according to the UCD 2017 Study, dairy manure accounts for one third of the total nitrogen applied to agricultural lands in the San Joaquin Valley and the Tulare Lake Basin.

The total estimated nitrogen excretion amount from dairy cattle in the Central Valley has risen exponentially from 1945 to 2005. Higher annual nitrogen excretion is driven by the growth in the Central Valley dairy herd size and the growth in per-cow milk production. Total nitrogen excretion from the Central Valley dairy herd has increased by about 950 percent, from less than 40,700 tons of nitrogen per year in the 1940s to 386,000 tons of nitrogen per year in 2005.[24]

It is therefore reasonable to conclude that dairy manure application to dairy cropland is responsible for a disproportionate share of nitrogen loading compared to nitrogen loading from traditional agricultural lands. While there is no dispute that the dairy industry is vital to our state, dairies must be responsible for managing the manure that they generate to avoid creating groundwater pollution. Dairies' manure management has been demonstrated to adversely affect beneficial uses of groundwater and cause severe health, social and economic impacts to communities in the Central Valley region who are reliant on groundwater as a drinking water source. This cannot continue unabated.

C. History of the 2013 Dairy General WDRs

Beginning in 1982, the Central Valley Water Board waived the requirement for most dairy operators in the Central Valley region to file a report of waste discharge (ROWD) or obtain waste discharge requirements.[25] By statutory enactment, all waivers existing as of 2000 were automatically terminated in 2003 if not rescinded before then.[26] In 2002, the Central Valley Water Board declared by resolution that it would issue a

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[24] *Harter, Final Report, supra*, p. 108.
[25] 2013 Dairy General WDRs, Information Sheet, p. IS-2; Wat. Code, § 13260, subd. (a).
[26] Wat. Code, § 13269, subd. (b)(1).

conditional waiver, waste discharge requirements, or National Pollutant Discharge Elimination System (NPDES) permits to the dairies in the Central Valley—although it was unable to do so before the deadline specified in the resolution.

In 2007, the Central Valley Water Board issued Waste Discharge Requirements General Order R5-2007-0035 (2007 Dairy General WDRs) for existing milk cow dairies—those that were operating as of 2005 and that had filed a ROWD in response to the Central Valley Water Board's request in 2005.[27]

The Asociación de Gente Unida por el Agua and the Environmental Law Foundation filed a petition asking us to review the 2007 Dairy General WDRs. After we dismissed the petition, the petitioners filed a petition for writ of mandate with the Superior Court of Sacramento County, arguing that the 2007 Dairy General WDRs were not consistent with the requirements of State Water Board Resolution No. 68-16, the Antidegradation Policy.[28]

Ultimately, the Court of Appeal in *Asociacion de Gente Unida por el Agua v. Central Valley Regional Water Quality Control Bd.* (2012) 210 Cal.App.4th 1255 (*AGUA*) rejected the 2007 Dairy General WDRs' antidegradation analysis on several grounds, one of which remains relevant to the 2013 Dairy General WDRs, as discussed below. The Court of Appeal found that the 2007 Dairy General WDRs allowed dischargers to continue historic practices that had already caused groundwater degradation. While the 2007 Dairy General WDRs purported to prohibit the further degradation of groundwaters consistent with the Antidegradation Policy, the court concluded that the 2007 General Dairy WDRs' prohibition was illusory because it lacked an effective method to detect further degradation, let alone prevent it.[29] The Central Valley Water Board issued the

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[27] Central Valley Water Board Order Nos. R5-2007-0035 (2007 Dairy General WDRs), p. 1, Finding ¶ 2, at <https://waterboards.ca.gov/public_notices/petitions/water_quality/docs/2026/r5-2007-0035.pdf> (as of Sept. 4, 2026); see also 2013 Dairy General WDRs, Information Sheet, p. IS-2.

[28] State Water Board Resolution No. 68-16 is at <http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf> (as of Aug. 22, 2026).

[29] *AGUA, supra*, 210 Cal.App.4th 1255, 1274-78.

2013 Dairy General WDRs to replace the 2007 Dairy General WDRs in response to the *AGUA* decision.

D. The 2013 Dairy General WDRs

The 2013 Dairy General WDRs apply to owners and operators of existing milk cow dairies of all herd sizes within the Central Valley region.[30] It defines "existing milk cow dairies" as all dairies that were operating as of October 17, 2005, filed a complete ROWD in response to the Central Valley Water Board's letter in 2005 requesting a ROWD, and had not expanded since October 17, 2005.[31] The permissible herd size of the existing milk cow dairies is the maximum number of mature dairy cows identified in the ROWD, plus an additional 15 percent to account for the normal herd size variation expected to occur at the dairies.[32] The 2013 Dairy General WDRs regulate approximately 1,300 dairy operations.[33] The 2013 Dairy General WDRs categorize four primary areas of manure discharges in relation to the manure's location on dairies or how it is managed: production areas, such as milking parlors, corrals, and feed storage areas;[34] land application[35] (e.g., applying manure and fertilizers to cropland); new or

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[30] 2013 Dairy General WDRs, p. 1, Finding ¶ 1.

[31] *Id*., p. 2, Finding ¶ 7.

[32] *Id*., p. 2, Finding ¶¶ 7-9. Herd sizes fluctuate as dairies operators manage the herd by continually producing calves to maintain a consistent production of milk. The producing calves are replaced over time and excess cows are marketed for beef production or for replacement elsewhere. (*Id*., p. 2, Finding ¶ 8.) An increase in the number of mature cows of more than 15 percent is considered an "expanded" dairy not eligible for coverage under the 2013 Dairy General WDRs. (*Id*., Information Sheet, p. IS-4.)

[33] *Id*., p. 3, Finding ¶ 12.

[34] Production areas include "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." (2013 Dairy General WDRs, p. 19, § D.)

[35] The 2013 Dairy General WDRs describes land application as the "application of animal waste and other materials containing nutrients to any cropland under control of the Discharger …." (*Id*., p. 21, § E.5.)

expanded manure retention ponds; and existing manure retention ponds[36] (hereinafter referred to as the four primary sources of dairy manure discharges).[37]

Pertinent to the issues addressed in this order, the 2013 Dairy General WDRs issued in 2013 contains the following receiving groundwater limitation: "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"[38] (hereafter, Groundwater Limitation). We are most concerned here with the water quality objective to support the municipal and domestic supply beneficial use, the maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) for nitrate (this water quality objective is hereinafter referred to as the nitrate water quality objective).[39] We support the Groundwater Limitation as drafted, except that it omits a requirement that the dairy manure discharges also not "contribute" to an exceedance of the water quality objectives, which is an important restriction where, as here, there may be multiple sources of pollution. However, as we will explain in Section III, the bigger problem is that the 2013 Dairy General WDRs do not require dairies to restrict their land application of dairy manure to levels that are directly related to the nitrate water quality objective.

The Groundwater Limitation is immediately effective, except where a dairy is in compliance with the 2013 Dairy General WDRs' time schedule.[40] Briefly, the time

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[36] The 2013 Dairy General WDRs define "existing ponds" as those wastewater ponds in operation as of May 3, 2007, when the Central Valley Water Board issued the dairy general waste discharge requirements in 2007. (*Id*., p. 16, fn. 5.)

[37] *Id*., Information Sheet, p. IS-24.

[38] *Id*., p. 23, § F.1. The 2013 Dairy General WDRs regulate dairy discharges to groundwater and do not authorize point source discharges into surface waters, including waters of the United States (although the 2013 Dairy General WDRs contain various prohibitions concerning discharges to surface waters). Our review here is limited to issues regulated by the 2013 Dairy General WDRs—discharges to groundwater.

[39] See *id*., Information Sheet, p. IS-8 ("Water quality objectives that apply to groundwater include, but are not limited to, (1) numeric objectives, including the bacteria objective and the chemical constituent's 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"); see Cal. Code Regs., tit. 22, § 64431, Table 64431A (providing an MCL of 10 mg/L for nitrate (as nitrogen)).

[40] 2013 Dairy General WDRs, p. 23, fn. 6, § F.1, pp. 28-29, § M.

schedule consists of a two-phase, iterative process, totaling a maximum of 16 years. The time schedule applies to any deficient management practice employed for each of the four primary sources of dairy manure discharges that impacts groundwater (production areas, land application, existing manure retention ponds, and new or expanded manure retention ponds). As a result, each dairy subject to the 2013 Dairy General WDRs must implement management practices in accordance with the time schedule and, ultimately, is required to comply with the Groundwater Limitation no later than the end of the 16-year time schedule.[41]

Consistent with the State Water Board Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program[42] (Nonpoint Source Policy), the 2013 Dairy General WDRs provide the option for dairies to join a third-party intermediary that has agreed to take on certain responsibilities for its members, including developing and implementing a representative monitoring program. A representative monitoring program, if properly designed, can provide adequate information for evaluating whether a nonpoint source program is meeting its goals.[43] The Central Valley Water Board approved a representative monitoring program workplan submitted by the Central Valley Dairy Representative Monitoring Program (CVDRMP) in 2012.[44] Because more than ninety-eight percent of dairies subject to the 2013 Dairy General WDRs participate in the CVDRMP's representative monitoring program,[45] we focus much of our discussion in this order on the CVDRMP and its

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[41] The 16-year timeframe for dairies to implement management practices protective of groundwater quality is the time within which dairy discharges must cease causing an exceedance of the Groundwater Limitation. It is not the deadline within which water quality objectives must be achieved in the groundwater itself.

[42] The Nonpoint Source Policy is at <http://www.waterboards.ca.gov/water_issues/programs/nps/docs/plans_policies/nps_iepolicy.pdf> (as of Aug. 22, 2026).

[43] We note that the 2013 Dairy General WDRs identify the representative monitoring program as serving the purpose of evaluating member dairies' compliance with the Groundwater Limitation. (2013 Dairy General WDRs at p. 29, § M.) Given the fact, as discussed below, that industry-wide protective management practices were not developed, we are not convinced that the representative monitoring program could serve this purpose.

[44] *Id*., Information Sheet, p. IS-32.

[45] *Id*., Information Sheet, p. IS-30.

representative monitoring report. For dairies participating in a representative monitoring program, the first phase of the time schedule assigns six years to the representative monitoring program to, among other requirements, conduct studies to identify any deficient management practices and identify upgrades or alternative practices for dairies to implement to comply with water quality requirements.[46] At the end of the first phase (which concluded in April 2019), the 2013 Dairy General WDRs require the CVDRMP to submit a summary representative monitoring report which identifies protective management practices that member dairies must implement during the time schedule's second, ten-year phase to meet the Groundwater Limitation.[47] In the report, the CVDRMP is required to identify time schedules for the implementation of the identified management practices that are as short as practicable, but in no case longer than ten years from the date the Executive Officer approves the report.[48] The CVDRMP's proposed time schedules for final compliance must be supported by "appropriate technical and economic justification."[49]

The 2013 Dairy General WDRs also contain an opportunity for extensions to the time schedule deadlines that is available only for dairies participating in the representative monitoring program. The provision for extensions allows the Central Valley Water Board to modify any deadline contained within the time schedule, including the deadline to comply with the Groundwater Limitation, "based on evidence that meeting the compliance date is technically or economically infeasible," or that compliance by an earlier date is feasible.[50]

The 2013 Dairy General WDRs require that dairies use the following management practices to control the four primary sources of dairy manure discharges (production areas, existing manure retention ponds, new or expanded manure retention ponds, and land application areas).

For production areas, general grading and drainage and other practices to limit infiltration to groundwater must be implemented. Generally, such requirements include

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[46] *Id*., p. 29, § M.
[47] *Ibid*.
[48] *Ibid*.
[49] *Ibid*.
[50] 2013 Dairy General WDRs, p. 29, § M.

the design and maintenance of production areas in a manner that "limits infiltration so that wastes, nutrients, and contaminants generated are directed to the manure retention pond(s)."[51]

For existing manure retention ponds, the 2013 Dairy General WDRs require compliance with design standards specified under California Code of Regulations, title 27, applicable to confined animal facilities (i.e., lined or consisting of soils comprised of at least ten percent clay and not more than ten percent gravel or equivalent impermeability)[52] (generally referred to as title 27 minimum design standards). The Central Valley Water Board acknowledges in the 2013 Dairy General WDRs that the title 27 minimum design standards are not protective of groundwater under all conditions.[53] The Central Valley Water Board concludes, however, that the immediate replacement or retrofitting of existing manure retention ponds with single or double liners is not a practicable economic option for many dairies.[54] As a result, to control discharges from existing manure retention ponds, the 2013 Dairy General WDRs explicitly rely on the 16-year, iterative time schedule for applicable protective management practices to be identified by the CVDRMP and subsequently implemented by dairies, if determined to be necessary.[55] Thus, while the iterative, 16-year time schedule generally applies to each of the four primary sources of dairy manure discharges, the 2013 Dairy General WDRs expressly rely on the time schedule to evaluate and identify management practices for existing manure retention ponds already considered to cause unacceptable groundwater impacts.[56]

The requirements for new or expanded manure retention ponds are more stringent than the title 27 minimum design standards: they must be constructed in accordance with a "tier 1" or "tier 2" design approach. A tier 1 pond is constructed with a double liner consisting of two liners of 60 mil (0.06 inches) thickness high density

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[51] *Id*., p, 19, § D.1-5; *id*., Information Sheet, p. IS-15.

[52] *Id*., p. 16, § C.4; *id*., Information Sheet, pp. IS-8 to IS-10; see Cal. Code Regs., title 27, § 22562, subd. (d).

[53] 2013 Dairy General WDRs, p. 9, Finding ¶ 28.c; *id*., Information Sheet, p. IS-8 to IS-9.

[54] 2013 Dairy General WDRs, p. 16, Finding ¶ 4; *id*., Information Sheet, p. IS-18.

[55] *Id*., p. 9, Finding ¶ 28.c; *id*., Information Sheet, pp. IS-18 to IS-19.

[56] *Id*., p. 9, Finding ¶ 28.c; *id*., Information Sheet, p. IS-18.

polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with California Code of Regulations, title 27, section 20340) between the two liners. A tier 2 pond consists of a single liner (sited and constructed in accordance with United States Department of Agriculture Natural Resources Conservation Service [NRCS] Conservation Practice Standard 313 or equivalent) coupled with groundwater monitoring and technical reporting showing that the design is protective of groundwater quality.[57]

Land application of manure and fertilizers to crops must be in accordance with a nutrient management plan (NMP) certified by a specialist.[58] Attachment C to the 2013 Dairy General WDRs consists of the nutrient management specifications and planning requirements for manure and wastewater applied to land application areas, a key feature of which is the requirement that nutrients be applied to crops at what the 2013 Dairy General WDRs refer to as a "reasonable agronomic rate." The agronomic rate is expressed as an "application and removal" regulatory endpoint of 1.4.[59] More specifically, dairy manure must be applied to fields in amounts that ensure that the total nitrogen applied to any field (A, for application) does not exceed 1.4 times the nitrogen that will be removed from the field (R, for removal) in the harvested portion of the crop (often referred to as the A/R ratio), with some exceptions.[60] Any nutrients generated in

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[57] *Id*., p. 17, § C.5; *id*., Information Sheet, pp. IS-17 to IS-18.
[58] *Id*., Attach. C, NMP.
[59] *Id*., p. 20, § E.2 (requiring land application of manure be conducted with the technical standards for nutrient management contained in Attach. C, NMP); *id*., Attach. C, NMP, p. C-11, § V.B.2.
[60] The 2013 Dairy General WDRs were issued before we adopted Order WQ 2018-0002 (*Eastern San Joaquin River Watershed*) (see fn. 104, *post*, for a general description of that order) in which we endorsed the definitions for nitrogen applied and nitrogen removed developed by the 2014 Agricultural Expert Panel, and the 2013 Dairy General WDRs use somewhat different definitions. In contrast to Order WQ 2018-0002, the 2013 Dairy General WDRs includes in its computation of nitrogen application the nitrogen remaining in the soil from the previous season and atmospheric nitrogen deposition. With respect to the nitrogen removed, the 2013 Dairy General WDRs includes the harvested portion of the crop but not the nitrogen sequestered in the permanent wood of perennial crops. (Compare 2013 Dairy General WDRs, p. 21, § E.5. *and id.*, Attach. C, NMP, § V.B.1.a, & V.B.2.a, with Order WQ 2018-0002, p. 38.) In evaluating the different definitions, the CVDRMP's SRMR concludes that atmospheric nitrogen deposition is relatively negligible, and nitrogen deposited in soils is difficult to

excess of the targeted amount needed for crop production generally would be subject to offsite removal, treatment, or storage.[61]

For each of these sources of dairy manure discharges, except existing manure retention ponds, the Central Valley Water Board concluded that the above-noted management practices constitute "best practical treatment or control" (BPTC) under the Antidegradation Policy. For existing manure retention ponds, the Central Valley Water Board concluded that BPTC is the iterative, two-phase time schedule (i.e., requiring manure retention ponds found not to be protective of groundwater to be replaced or upgraded within the 16-year compliance deadline).[62]

The 2013 Dairy General WDRs also require each dairy to submit all reports as specified in the accompanying Monitoring and Reporting Program.[63] Dairies are required to monitor wastewater, soil, crops, manure, surface water discharges, and

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quantify and not necessary in the accounting scheme. (CVDRMP Summary Representative Monitoring Report, pp. 35-36, § 2.2.1.) As a result, the CVDRMP recommends that the 2014 Agricultural Expert Panel's definitions be adopted for use by dairies. (*Id*., p. 35, § 2.2.1.)

The regulatory framework established by this order continues the use of the A/R ratio (see discussion at Section III.A.6.a-b). Additionally, this order also recognizes (*post*, fn. 250 and corresponding text) the benefits of reporting the "A-R difference" value (nitrogen applied minus nitrogen removed) as providing useful information about how much nitrogen is left in the soil to potentially reach groundwater and directs it to be used in the INMP and included in the revised dairy general waste discharge requirements. The revised dairy general waste discharge requirements should use the definitions for nitrogen applied and nitrogen removed that we endorsed in WQ Order 2018-0002, in the absence of further direction from us following additional scientific review. (See State Water Board Order WQ 2023-0081 (*Central Coast Irrigated Agriculture*).)

[61] 2013 Dairy General WDRs, Attach. C, NMP, p. C-7, § IV (providing, "[e]xcess manure nutrients generated by the Discharger must be handled by export to a good steward of the manure, or the development of alternative uses"), p. C-11, § V.B.2.b (providing that if "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.")

[62] *Id*., pp. 8-9, Finding ¶¶ 28(a)-(d), pp. 15-22, §§ C - E; *id*., Information Sheet, pp. IS-14 to IS-19.

[63] *Id*., p. 27, § J.2.b.

storm water discharges. Dairies are also required to monitor surface water and groundwater (e.g., test domestic and agricultural wells) and submit reports in accordance with a monitoring and reporting program, or alternatively, participate in a "representative monitoring program."[64] Each dairy must prepare and implement a waste management plan for the dairy production area and prepare and implement a nutrient management plan for all areas used for land applying dairy manure (we discuss land application below).[65] Each dairy must retain records for the production area and the land application areas.[66]

E. The Petition and the State Water Board's Order to Review the 2013 Dairy General WDRs

On November 4, 2013, in response to the Central Valley Water Board's adoption of the 2013 Dairy General WDRs, Asociación de Gente Unida por el Agua and Environmental Law Foundation (collectively, petitioners) timely filed a petition for review of the 2013 Dairy General WDRs with the State Water Board. On December 15, 2015, the petitioners requested that we place the petition in abeyance. On December 14, 2017, petitioners requested that we remove the petition from abeyance and activate it. On December 21, 2017, we activated the petition and solicited responses to the petition from the Central Valley Water Board and other interested persons. Thereafter, responses to the petition were filed by the Central Valley Water Board and interested parties Dairy Cares, California Farm Bureau Federation, and James G. Sweeney and Ameila M. Sweeney, and the Central Valley Water Board filed the administrative record.[67]

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[64] *Id*., p. 27, § J.2 (requiring reports as specified in the attached Monitoring and Reporting Program). Dairies participating in the representative monitoring program will have their respective information reported by the program pursuant to an approved monitoring plan. (*Id*., MRP, Attach A, p. MRP-17.)

[65] *Id*., p. 26, §§ J.1.b (referring to Attachment B, the Waste Management Plan for Production Areas), J.1.c (referring to Attachment C, the Nutrient Management Plan).

[66] *Id*., p. 28, § K.

[67] The administrative record for this proceeding consists of the record prepared by the Central Valley Water Board on the adoption of the 2013 Dairy General WDRs and certain additional documents most of which post-date the adoption of the 2013 Dairy General WDRs that we have determined would aid our review. The additional record

documents are identified on the petition page at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/r5-2013-0122.html> (as of Aug. 22, 2026) and the additional documents are either posted on the petition webpage or direction is provided as to how they may be obtained as part of the public comment letters that were submitted in this matter. We provided notice that the aforementioned documents would be made a part of the administrative record when we circulated a draft of this order for public comment. The additional record documents include the following documents shared during noticed ex parte communications: (1) State Water Board, Staff handout, Background Information, Nitrate Discharges to Groundwater (Sept. 1, 2021); (2) PowerPoint Presentation, J.P. Cativiela, *et al*., CVDRMP, Summary Representative Monitoring Report (Sept. 27, 2021); (3) State Water Board Resolution No. 2019-0057 (excerpted recital); (4) Central Valley Water Board, New Nitrate Control Program, Coming Together to Resolve the Safe Drinking Water Challenge; (5) PowerPoint Presentation, Management Zones, Nitrate Control Programs, and Dairies (Oct. 11, 2021); (6) State Water Board, Staff handout, SWRCB Staff's Preliminary Straw Proposal - For Distribution to Stakeholders Waste Retention Ponds (Oct. 2021); (7) Map of Gioletti Dairy, Handout (Jan. 7, 2022); (8) PowerPoint Presentation, Data Needs (May 9, 2022); and (9) PowerPoint Presentation, J.P. Cativiela and Ryan Flaherty, Co-chairs, CDFA Manure Recycling & Innovative Products Task Force (April 11, 2022); and (10) California Department of Public Health, Nitrate Fact Sheet (May 2014).

The additional record documents also include those that are cited to in this order (which were not shared during the ex parte discussions): (1) CVDRMP, Summary Representative Monitoring Report (April 1, 2019); (2) Thomas Harter et al., Nitrogen Fertilizer Loading to Groundwater in the Central Valley, Final Report to the Fertilizer Research Education Program, Projects 11-0301 and 15-0454, California Department of Food and Agriculture and University of California, Davis (Aug. 2017); (3) Pacific Health Institute, The Human Costs of Nitrate-contaminated Drinking Water in the San Joaquin Valley (March 2011); (4) California Department of Food and Agriculture, California Crop Fertilization Guidelines (5) Environmental Justice Coalition for Water, Thirsty for Justice: A People's Blueprint for California Water (2005); (6) Carolina Balazs, *et al*., Social Disparities in Nitrate Contaminated Drinking Water in California's San Joaquin Valley, Environmental Health Perspectives (June 2011); (7) Central Valley Salinity Alternatives for Long-Term Sustainability, Fact Sheet, Nitrate Control Program; (8) Natural Resources Conservation Service, Conservation Practices Standard, Code 313; (9) Natural Resources Conservation Service, Conservation Practices Standard, Code 520; and (10) National Engineering Handbook, Part 651, chapter 10, appendix 10D.

Additionally, accompanying their written comments on our October 1, 2024, draft order, petitioners and Dairy Cares each presented additional evidence and requested we consider it in support of their respective comments, pursuant to the procedures in California Code of Regulations, title 23, section 2050.6, subdivision (a).

Specifically, petitioners requested the following documents be admitted to supplement the record: (1) Jenny Suckale, *et al.*, "Evidence of elevated risk for blue spells and blue-baby syndrome in the Central Valley, California" (Nov. 20, 2024); (2) Thomas Harter, *et al*., "Addressing Nitrate in California's Drinking Water: With a Focus

on Tulare Lake Basin and Salinas Valley Groundwater" (Jan. 2012); (3) Vicki Kretsinger Grabert, *et al*., Memorandum, "Alta Irrigation District Management Zone: Aggressive Restoration Alternative Modeling Scenario Results" (Sept. 29, 2016); (4) CV-SALTS, Measuring Our Impact on the Central Valley at <https://cvsalts.mljenv.com/> (accessed Dec.15, 2024); (5) Central Valley Water Board, Executive Officer's Report (Oct. 18, 2024); (6) California Water Boards, "Analysis of Available Irrigated Lands Regulatory Program (ILRP) Nitrogen Data" (Nov. 8, 2024); (7) Johnathan London, *et al*., UC Davis, Center for Regional Change, "The Struggle for Water Justice In California's San Joaquin Valley: A Focus On Disadvantaged Unincorporated Communities" (Feb. 2018); (8) Sarah Acquah and Maura Allaire, Disparities in drinking water quality: Evidence from California, Water Policy, Vol. 25 No. 2 (Feb. 3, 2023); (9) State Water Board, Order WQ 2023-0081, In the Matter of Review of General Waste Discharge Requirements for Discharges from Irrigated Lands Order No. R3-2021-0040 (Sept. 20, 2023); (10) California Regional Water Quality Control Board, Central Coast Region, General Waste Discharge Requirements for Discharges from Irrigated Lands, Order No. R3-2021-0040, Attach. A: Findings (April 15, 2021); (11) Iael Raij-Hoffman, *et al*., Water Resources Research, 60, e2024WR037973, "Assessing nitrate leaching during drought and extreme precipitation: Exploring deep vadose-zone monitoring, groundwater observations, and field mass balance" (2024); (12) Central Valley Water Board, Resolution No. R5-2020-0057 (Dec. 10, 2020); and (13) Central Valley Water Board (citing to all orders adopted since 2002) at <https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders> (as of Aug. 22, 2026).

We accept all documents into the record identified above in items one through 12. With respect to item 13, in which petitioner requests all final orders adopted by the Central Valley Water Board since 2002 be admitted to show that no individual waste discharge requirements for a private dairy have been adopted since 2010 to support their argument that the Central Valley Water Board has failed to comply with the duty to issue waste discharge requirements for known discharges of waste from new or expanded dairies that are not enrolled in the 2013 Dairy General WDRs, we decline to accept such orders into the record. Instead, we acknowledge that our understanding is that the Central Valley Water Board has not been issuing individual waste discharge requirements for new or expanded dairies for which reports of waste discharge have been filed, as discussed in footnote 220, infra.

Dairy Cares requested the following documents supplement the record: (1) Till E. Angermann, "Using the Water Balance Method for Regulatory Compliance Purposes on Dairies" (Dec 6, 2024); (2) Kyle Parreira, "Process and Cost for Constructing Lined Dairy Ponds" (Dec. 11, 2024); (3) Manure Recycling and Innovative Products Task Force, Final Report to Secretary Karen Ross, Cal. Dept. Food & Ag. (Dec. 14, 2022); (4) Stephen R. Kaffka, *et al.*, UC Davis Biomass Collaborative, "Manure Nutrient Recovery, Removal, and Reuse on California Dairies," (Oct. 15, 2022); (5) Agricultural Expert Panel recommendations to the State Water Board "Conclusions of the Agricultural Expert Panel" (Sept. 9, 2014); (6) Thomas Harter, *et al*., UC Davis, Center for Watershed Sciences, Report for the State Water Board Report to the Legislature, "Addressing Nitrate in California's Drinking Water with a Focus on Tulare Lake Basin and Salinas Valley Groundwater" (Jan. 2012); (7) Vicki Kretsinger Grabert and Till

Angermann, CVDRMP, Annual Reports (for the reporting years 2013 through 2023) (dated April 1 of the year following each reporting year); (8) Letters from Vicki Kretsinger Grabert and Till Angermann to the Central Valley Water Board (dated Nov. 28, 2014, Sept. 5, 2015, April 1, 2016, and Dec. 8, 2016); (9) Till Angermann, "Protocols for Measuring Dairy Lagoon Seepage Using the Water Balance Method" (March 2012); (10) Till Angermann, CVDRMP, "2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation Workplan" (June 19, 2014); (11) Till Angermann, CVDRMP, "2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation Results" (March 27, 2015); (12) Till Angermann, *et al*., CVDRMP, "Seepage Rates of Liquid Dairy Manure Lagoons in the Central Valley of California and Associated Subsurface Nitrogen Mass Emissions" (Nov. 30, 2015); (13) Till Angermann and Vicki Kretsinger Grabert, CVDRMP, "Controlling Seepage from Liquid Dairy Manure Lagoons in the Central Valley of California" (June 28, 2016); (14) Till Angermann and Vicki Kretsinger Grabert, CVDRMP, "Evaluation of Earthen Liquid Dairy Manure Lagoons in the Central Valley of California: Seepage, Mass Emissions, and Effects on Groundwater Quality" (April 6, 2017); (15) Till Angermann, CVDRMP "Corral Subsurface Hydrogeologic Investigation Workplan" (Aug. 21, 2017; and (16) Till Angermann, CVDRMP, "Corral Subsurface Hydrogeologic Investigation, Including Literature Review" (Feb. 21, 2019). We accept all documents into the record identified in items one through 16.

Additionally, accompanying their written comments on our June 15, 2026, revised draft order, California Coastkeeper Alliance, Dairy Cares, and California Rural Legal Assistance each presented additional evidence and requested us to accept it into the administrative record in support of their respective comments, pursuant to the procedures under section 2050.6.

Specifically, California Coastkeeper Alliance requested the admission of a report entitled, "Confined Animal Facility Permitting and Reporting Under the Porter-Cologne Water Quality Control Act: An Analysis of Regional Board Activities," by Zoe Robertson, et al., Stanford Law School Environment & Natural Resources Law and Policy Program (Feb. 2026). Dairy Cares requested the submission two technical memoranda, entitled: "Dairy Industry Market Conditions, Trends, and Cost Pressures," by ERA Economics LLC (July 30, 2026), and "Comment on computational error in Stanford School of Law report," by Till E. Angermann (July 27, 2026). California Rural Legal Assistance (CRLA) requested the admission of several items that are referenced in its July 30, 2026 comment letter, specifically Item 1: Figures 1 through 5 and Tables 1 through 2; Item 2: Data analysis and findings by CRLA and Santa Clara University's Water and Climate Justice Lab, specifically findings 1 through 8; and Item 3: (a) Survey results conducted by CRLA and Santa Clara University's Water and Climate Justice Clinic in 2023, and (b) "Toward the Human Right to Water for Vulnerable Communities: The Effectiveness of Stakeholder Process to Control Regional Shallow Groundwater Contaminated by Nitrates," by Iris T. Stewart, *et al*., (Oct. 2005). We accept these documents and material into the record with the exception of CRLA's Item 3(a), for failure to comply with California Code of Regulations, title 23, section 2050.6, subdivision (a)(1), and because the actual survey results were not submitted with the request. We are, however, concerned about the issues raised by CRLA's Item 3(a), so we direct the Central Valley

On September 4, 2018, we adopted Order WQ 2018-0021 to review the 2013 Dairy General WDRs on our own motion to allow sufficient time to address the merits of certain issues in the petition.[68] To the extent petitioners raised issues that are not discussed in this order, either in whole or in part, such issues are dismissed as not raising substantial issues appropriate for review in this order.[69]

F. The Central Valley Dairy Representative Monitoring Program and its 2019 Summary Representative Monitoring Report

In accordance with the requirements of the 2013 Dairy General WDRs, the CVDRMP developed a workplan for its proposed representative groundwater monitoring program to serve as the alternative to installation of individual monitoring wells at each dairy.[70] The CVDRMP's workplan proposed to collect data from monitoring wells at 42 dairies spanning from Tehama County in the north to Kern County in the south, with 440 wells at 274 sites. It also proposed to evaluate dairy operations and management practices for specific waste management practices to facilitate the evaluation of cause-and-effect relationship to groundwater impacts and to establish current groundwater conditions.[71]

The CVDRMP also submits annual reports each year for its members to satisfy annual reporting requirements in the 2013 Dairy General WDRs. The annual reports describe the monitoring activities that were conducted during the preceding year, evaluate whether the monitored dairies are implementing management practices that are protective of groundwater quality, and evaluate whether the CVDRMP is on track to

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Water Board to address these issues during its next annual CV-SALTS report in footnote 268, *post*.

To the extent any other commenters included evidence in their written comments or cited evidence in support of their written comments without adhering to the process in section 2050.6, subdivision (c), such evidence does not supplement the administrative record and has not been considered for this order.

[68] See Cal. Code Regs., tit. 23, § 2050.5, subd. (c).

[69] *Id*., § 2052, subd. (a)(1); *People ex rel. Cal. Regional Water Quality Control Bd. v. Barry* (1987) 194 Cal.App.3d 158, 175-77; *Johnson v. State Water Resources Control Board* (2004) 123 Cal.App.4th 1107, 1114.

[70] 2013 Dairy General WDRs, MRP, Attach. A, p. MRP-22, § III.

[71] *Id*., Information Sheet, p. IS-32.

timely complete and submit a summary representative monitoring report (due April 1, 2019).[72]

The CVDRMP timely submitted its Summary Representative Monitoring Report (SRMR) on April 1, 2019. The report's findings and conclusions are informed not only by the annual reporting on the CVDRMP's groundwater monitoring[73] and dairies' management practices as required by the 2013 Dairy General WDRs, but also on a collection of detailed technical reports provided to the CVDRMP since its inception in 2010, academic literature review, consultation with academic and professional experts in relevant fields (e.g., hydrology, agronomy, engineering), and special studies and other work related to waste retention ponds not required by the General Dairy WDRs. As detailed below, we find that this body of work has led to an improved understanding of dairies' manure management practices and the way those practices impact groundwater quality.[74]

The CVDRMP's SRMR concludes that impacts to groundwater from dairies were observed throughout the representative monitoring network.[75] These groundwater impacts appear throughout the region, although the data show that dairy impacts to groundwater vary depending on several factors, including soil type, management practices, and depth to groundwater.[76]

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[72] *Id*., p. 29, § M; *id*., Information Sheet, pp. IS-32 to IS-33.

[73] The CVDRMP started groundwater monitoring activities in January 2012 on 18 dairies in Stanislaus and Merced Counties. In January 2013, monitoring activities were expanded to a total of 42 dairies, including facilities as far north as Tehama County and as far south as Kern County. The monitoring well network on these dairies comprises of [*sic*] 443 dedicated monitoring wells that are distributed over 250 well sites. At most of these well sites, individual wells are arranged in nested facilities (i.e., two or more wells installed adjacent to each other) to facilitate groundwater sample retrieval from the uppermost zone of first-encountered groundwater under variable groundwater level conditions. Monitoring wells were located and designed such that they intercept groundwater that originates from individual management units (i.e., downgradient of lagoons, corrals, and crop fields). (CVDRMP Summary Representative Monitoring Report, p. 6, § 1.4.1 (internal footnote omitted).)

[74] *Id*., pp. i, 7-9, 26-30.

[75] *Id*., p. 6, § 1.4.1.

[76] *Id*., p. i.

The CVDRMP's SRMR also details the CVDRMP's findings and recommendations for on-farm management practices and provides cost estimates for its recommended and non-recommended practices for each of the four primary sources of dairy manure discharges. However, although the 2013 Dairy General WDRs require the SRMR to include proposed solutions that *will* result in compliance with the Groundwater Limitation within the final compliance deadline for management practices found not to be protective of groundwater quality,[77] the CVDRMP's SRMR's principal findings and recommendations pivot from that directive. The CVDRMP's SRMR shift is premised on two significant developments that occurred after the Central Valley Water Board adopted the 2013 Dairy General WDRs.

1. Improved Understanding of Relative Nitrogen Loading Rates

The first of those significant developments is the CVDRMP's analysis of special studies that has led to an improved understanding of relative nitrogen loading rates from manure retention ponds, production areas, and land application areas. The CVDRMP's SRMR combines the results of its own studies that estimated loading rates from manure retention ponds and production areas with the UCD 2017 Study's estimates of nitrogen fertilizer loading rates from different sources in the Central Valley, including dairy cropland. In a marked departure from the historic belief that seepage from existing manure retention ponds is the most significant source of nitrogen loading to groundwater from dairies, the CVDRMP's SRMR concludes that approximately 94 percent of all nitrogen loading from dairies (estimated at approximately 79,000 tons of nitrogen per year from all dairies in the Central Valley) is due to spreading dairy manure across croplands, whereas seepage from manure retention ponds and production areas comprise four percent and two percent, respectively.[78] The core of the CVDRMP's

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[77] 2013 Dairy General WDRs, p. 29, § M.

[78] CVDRMP Summary Representative Monitoring Report, p. 9, § 1.4.2. We evaluated the underlying data regarding the relative contributions to nitrogen loading from the sources of dairy manure discharges and generally agree with those findings and conclusions.

SRMR's recommendations are based on the new understanding of the relative contribution of nitrogen loading from the different sources of dairy discharges.

Regarding management practices for production areas and existing manure retention ponds, excepting those that "do not intersect the water table,"[79] the CVDRMP's SRMR recommends those practices required under the 2013 Dairy General WDRs be continued without any added requirements. In recognition of the relatively low nitrogen loading from these discharge sources, coupled with the significant costs to implement improved management practices, particularly for manure retention ponds (e.g., installing a liner), the CVDRMP's SRMR's overarching proposed strategy is to focus improved control strategies on loading from land application.

For new or expanded manure retention ponds, the CVDRMP's SRMR recommends replacing the tier 1 and tier 2 alternative requirements with a single-layer liner requirement with no groundwater monitoring.[80] For different reasons, the CVDRMP's SRMR concludes the tiered options are unrealistic or too costly.[81]

Regarding land application practices, while a majority of the dairies reported applying manure nitrogen in accordance with the 1.4 A/R regulatory endpoint, the CVDRMP's SRMR concludes that such reporting is likely inaccurate or much of the manure is "unaccounted for."[82] The rationale provided is that there is a high level of imprecision associated with implementation of the A/R ratio, stemming from the ratio's inherent assumptions, imprecise sampling and testing to quantify key inputs and outputs, and generalizations regarding nutrient inputs that in some cases replace actual

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[79] *Id*., p. 57, § 2.7.4.
[80] *Id*., pp. 58-59, § 2.8.
[81] For example, because tier 1 ponds (double liner with leachate collection and removal system) are approximately 40 to 50 percent more expensive than tier 2 (single liner with monitoring and reporting) ponds, few have been built. Also, because the tier 2 option requires installation of monitoring wells, groundwater quality monitoring and reporting, costs are significant and, in any event, the Central Valley Water Board is disinclined to authorize use of a tier 2 pond in areas where the Groundwater Limitation is exceeded in the groundwater underlying the pond. (*Id*., pp. 58-59, § 2.8.)
[82] *Id*., p. 10, § 1.5.1.1.

measurements.[83] The CVDRMP's SRMR asserts that these imprecisions need to be addressed to improve the utility of the A/R ratio as a nutrient management tool.[84]

It is of no surprise, then, that the CVDRMP's SRMR recommends removing the 1.4 A/R ratio from the 2013 Dairy General WDRs as a regulatory endpoint, in part owing to these imprecisions but also because dairies are not currently able to comply with it.[85] We do not agree that eliminating the use of the A/R ratio would be appropriate at this time, largely because we do not currently have a better accounting approach for estimating the amount of nitrogen that is applied to land and may reach groundwater. Rather, in Section III.A.5.f. we direct the Central Valley Water Board to continue the use of the A/R ratio approach, but to require dairies to utilize more accurate methods to improve their direct measurements of both A and R, and to work with our staff to ensure that the A and R data is properly reported in a usable format into our GeoTracker database.[86] We also identify a new alternative approach for accounting for all nitrogen produced by a dairy and its disposition, which we refer to as the whole-farm nitrogen

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[83] The CVDRMP Summary Representative Monitoring Report explains:

> Evidence garnered from annual reports to the Regional Water Board by individual dairies suggests a substantial amount of "unaccounted-for" manure nitrogen exists on many dairies. This unaccounted-for portion is essentially the difference between nitrogen excreted by cows (supply) and what is reported as being applied to agricultural fields to fertilize crops (demand) and/or exported from the dairy. Some of the unaccounted-for portion of nitrogen can be attributed to volatilization of nitrogen as ammonia and other gases, but those pathways don't fully explain the difference between excreted nitrogen and applied nitrogen. Large amounts of unaccounted-for nitrogen, combined with the imprecision in measurement of applied nitrogen and irrigation water, can result in overapplication of nitrogen to crops and reduced [nitrogen uptake efficiency].

(*Id*., p. 10, § 1.5.1.1.)

[84] *Id*., p. 38, § 2.2.4.

[85] See *id*., pp. ii-iii, p. 10, § 1.5.1.3, p. 39, § 2.2.4.

[86] When we refer to the GeoTracker database in this order, we mean the current GeoTracker database or any successor database that we utilize for similar purposes in the future. All data required to be reported by this order, the 2013 Dairy General WDRs, and the revised dairy general waste discharge requirements is public data, and it is very important that the data be submitted in a usable format that is both transparent to the public and suitable for data analysis. For example, pdf uploads are not suitable for data analysis, so they are generally not in a "usable format."

accounting approach, in Section III.A.4. We direct the Central Valley Water Board to develop this new approach. Depending on its efficacy and accuracy over time, it may either complement or replace the direct A and R measurement approach.

Regarding the scale of nitrogen loading to groundwater due to land application practices, the CVDRMP's SRMR recognizes that current economic, technical, and regulatory challenges associated with potential solutions to conduct land application in a way that would comply with water quality requirements, such as increasing manure exports off-dairy to other irrigated crops,[87] or manure denitrification, do not currently exist at sufficient scale.[88]

The CVDRMP's SRMR does not identify upgraded management practices that dairies could implement to meet the Groundwater Limitation within the 2013 Dairy General WDRs' final compliance deadline, as required by Section M of the 2013 Dairy General WDRs. Instead, its recommendations call for a staged strategy that prioritizes near-term efforts to be implemented, such as flow meters, improved sampling and reporting, and enhanced education on nitrogen use efficiency and planning.[89] The CVDRMP's SRMR reasons that no dairies in the region will be able to comply with the Groundwater Limitation until a significant and sustained collaborative effort among dairies, academia, government, and relevant industries coalesces to develop strategies to remove excess manure from dairies at the requisite scale. That effort would include

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[87] See *Harter*, *Final Report*, *supra*, at pp. 10-11, stating:

> To reduce potential groundwater nitrogen loading from cropland across the Central Valley and thus improve the quality of recharge water from the agricultural landscape, there are only few options, dictated by the magnitude of nitrogen fluxes:
> - Increase the amount of harvest without also increasing the amount of synthetic or organic fertilizer
> - Reduce the nitrogen input to the agricultural landscape. However, of all fluxes into the agricultural landscape, only synthetic fertilizer use can be reduced significantly without significantly changing Central Valley landuse: Cities and particularly dairy farming are generating large amounts of nitrogen that is currently recycled in the agricultural landscape.

[88] *Id*., pp. 12-13, § 1.5.2.

[89] *Id*., p. 10, § 1.5.1.3, p. 12, § 1.5.2.

research, development of markets for manure products, and incentive programs, along with other actions.[90]

2. CVDRMP's Shift Away from Requirement to Implement the Groundwater Limitation within Ten Years

This brings us to the second significant development that occurred after the Central Valley Water Board adopted the 2013 Dairy General WDRs that led the CVDRMP's SRMR to shift away from recommending management practices that would comply with the Groundwater Limitation within ten years. In 2018, the Central Valley Water Board adopted amendments to its water quality control plans for the Sacramento River and San Joaquin River Basins and the Tulare Lake Basin (Basin Plans) to incorporate a Central Valley-wide Salt and Nitrate Control Program referred to as the "Central Valley Salinity Alternatives for Long-Term Sustainability" (hereafter, CV-SALTS).[91]

The CVDRMP's SRMR acknowledges that the Central Valley Water Board had not yet obtained our necessary approval of CV-SALTS, but characterizes CV-SALTS as a "monumental shift in policy" insofar as the amendments recognize that currently available technology and practices cannot be expected to ensure nonpoint source discharges are able to meet the nitrate water quality objective in the near future and the return of groundwater to drinking water standards could take many decades.[92]

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[90] *Id*., p. ii.

[91] Central Valley Water Board, Resolution R5-2020-0057, *Revisions to the Amendments to the Water Quality Control Plans for the Sacramento River and San Joaquin River Basins and the Tulare Lake Basin to Incorporate a Central Valley-Wide Salt and Nitrate Control Program* (hereafter, CV-SALTS) at <https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2020-0057_res.pdf> (as of Aug. 22, 2026). The Central Valley Water Board initially adopted the CV-SALTS by Resolution R5-2018-0034 and adopted revisions to the program by Resolution R5-2020-0057. CV-SALTS was adopted as revisions to the Basin Plans but has not yet been incorporated into the Basin Plans.

[92] CVDRMP Summary Representative Monitoring Report, pp. ii-iii. The CVDRMP's SRMR's recommendations relied on the version of CV-SALTS initially adopted by the Central Valley Water Board in 2018, prior to our October 2019 direction to the Central Valley Water Board to revise CV-SALTS. (State Water Board Resolution No. 2019-0057). As a result, the CVDRMP's recommendations are not informed by the final version of CV-SALTS, as discussed in the next Section.

Resting on that characterized shift in policy, the CVDRMP's SRMR concludes that the directive in the 2013 Dairy General WDRs for it to recommend protective management practices be implemented within 10 years is unrealistic. The CVDRMP's SRMR recommends the development of revised dairy waste discharge requirements that would allow dairies to avail themselves of CV-SALTS' flexible compliance approach while progressively improving management practices.[93] The CVDRMP's SRMR suggests that the dairies and cooperating entities work toward the goal of achieving "whole-farm nitrogen balance"[94] by reducing excess nitrogen loading. In the meantime, the CVDRMP's SRMR recommends its dairy members participate in the CV-SALTS compliance approach, including participation in management zones, in replacement drinking water efforts, and the funding of salinity management and monitoring programs.[95] The CVDRMP's SRMR recommends a continuing and enhanced role for the CVDRMP (similar to an ILRP third-party coalition) to assist in administering its recommendations.[96]

Taking these considerations into account, the CVDRMP's SRMR recommends generally that the 2013 Dairy General WDRs' final deadline to comply with the Groundwater Limitation should be removed and replaced with another deadline deemed suitable by the Central Valley Water Board in revised waste discharge requirements.[97]

G. The CV-SALTS Program

On October 16, 2019, we approved the initial iteration of CV-SALTS, but with directions for the Central Valley Water Board to make targeted revisions to the Amendments within one year.[98] The directed revisions that are most relevant to this proceeding include our requirement that management zone implementation plans "must include proposals for enforceable and quantifiable interim deadlines that focus on reducing nitrate in ongoing discharges and a proposed final compliance date for

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93 CVDRMP Summary Representative Monitoring Report, pp. ii-iii.
94 We discuss the concept of whole-farm nitrogen balance at Section III.A.4.
95 CVDRMP Summary Representative Monitoring Report, p. iii.
96 *Id*., pp. 20-21.
97 *Id*., p. iii.
98 State Water Board Resolution No. 2019-0057.

ongoing discharges of nitrate to cease causing or contributing to exceedances of the applicable water quality objective in the receiving water,"[99] and our requirement that "all discharges of nitrate must cease causing or contributing to exceedances of water quality objectives in the receiving water within a term that is as short as practicable for each discharger or category of dischargers participating in the management zone but in no case longer than 35 years."[100] We also stated that the Central Valley Water Board "should set a maximum of 50 years as a goal for restoring basins to achieve nitrate water quality objectives throughout the basins" and "may recognize, however, that some basins may require more than 50 years to achieve restoration or may qualify for de-designation of beneficial uses through the water quality control plan amendment process."[101]

We also directed the Central Valley Water Board to "ensure that affected residents in localized areas within management zones with nitrate concentrations exceeding 10 mg/L ("hot spots") are identified and provided access to drinking water."[102] Finally, we stated that waste discharge requirements implementing CV-SALTS must comply with the Nonpoint Source Policy as applicable,[103] and that CV-SALTS does not supersede the precedential requirements contained in our Order WQ 2018-0002.[104] The

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[99] *Id*., Resolved ¶ 4.g.
[100] *Id*., Resolved ¶ 4.h.
[101] *Id*., Resolved ¶ 4.h.
[102] *Id*., Resolved ¶ 1.g.
[103] *Id*., Resolved ¶ 1.l.
[104] *Id*., Resolved ¶ 1.k. In WQ Order 2018-0002, we reviewed the Central Valley Water Board's Waste Discharge Requirements General Order No. R5-2012-0116 which regulates discharges to groundwater and surface water from irrigated lands for growers within the Eastern San Joaquin River Watershed that are members of a third-party group. In that order we provide precedential direction to all regional water quality control boards regarding their irrigated lands regulatory programs to better protect water quality by minimizing over-application of nitrogen fertilizers, improving grower management practices, and creating a foundation for developing and sharing best farming practices on a statewide basis. While that precedential direction does not apply to dairies because they are not part of our irrigated lands regulatory program, some of the issues addressed in WQ Order 2018-0002 are relevant to this proceeding, as we discuss further in this order.

Central Valley Water Board made the directed revisions, and we approved the revised CV-SALTS on June 1, 2021.[105]

The CV-SALTS program prioritizes addressing health risks from drinking water exceeding the nitrate standard. Prioritized groundwater basins and sub-basins have been identified for program implementation according to specified timelines. Nonprioritized basins will follow as directed by the Central Valley Water Board's Executive Officer. Participants in prioritized areas must assess nitrate levels in groundwater used for drinking water and submit an Early Action Plan if levels exceed the primary MCL for nitrate.[106]

For long-term implementation, CV-SALTS contains two approaches: Path A reflects the traditional permitting approach where the individual assumes all compliance responsibilities and costs. Path A is available at a permittee's election or when a management zone is not available. Path B uses the establishment of management zones and the development of management zone implementation plans to foster collaborative and cost-effective nitrate control solutions, including providing replacement water to residents reliant on domestic wells with unsafe levels of nitrate.[107]

The Central Valley Water Board has recently started to approve management zone implementation plans, with its initial approval of the Modesto Management Zone Implementation Plan (MZIP) on June 3, 2026.[108] The Modesto Management Zone participants include several categories of dischargers, including dairies, and its MZIP acknowledges that the management zone will need to address the revised dairy general waste discharge requirements that we direct as a result of this proceeding in its future MZIP deliverables for its dairy participants.[109] We encourage the Central Valley Water

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[105] State Water Board Resolution 2021-0019.

[106] See generally, CV-SALTS, *supra*, ch. 4.

[107] See generally, *ibid*.

[108] Central Valley Water Board Order R5-2026-0032, at <https://waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2026-0032_wdrs.pdf> (as of Aug. 22, 2026).

[109] Appendices - Modesto Management Zone Implementation Plan, App. NRP-2a, Nitrogen Reduction Plan for Dairies (Sept. 2023), pp. 2-3, at the Modesto MZIP Appendices link at <https://www.waterboards.ca.gov/cvsalts/nitrate_mz/modesto_turlock_mz/> (as of Aug. 22, 2026). This is particularly important because, contrary to the assertions of some

Board to work with all of the management zones to integrate the appropriate requirements of this order's regulatory framework into future iterations of their MZIPs and associated deliverables for their dairy participants.

Importantly, the time schedules authorized by CV-SALTS (i.e., for discharges of nitrate to cease causing or contributing to exceedances of the water quality objective in the receiving water within a term that is as short as practicable but in no case longer than 35 years) did not commence upon the effective date of the CV-SALTS. Any authorized time schedule under CV-SALTS does not commence until the Central Valley Water Board grants an applicant's request for an exception to the discharge requirements for meeting a nitrate water quality objective pursuant to the Exceptions Policy.[110] Consequently, the time schedule start dates (but not necessarily the final compliance dates) will vary depending on when the corresponding exception is granted to each discharger within their respective management zones.[111] We further discuss this issue at Section III.A.2.

H. Understanding Nitrate and Health Impacts from Nitrate in Drinking Water

Nitrate and nitrite are compounds commonly found in drinking water supplies, with nitrate being the most prevalent due to its stability in oxygen-rich environments.[112] Their presence in groundwater is generally linked to septic systems, manure, and use of fertilizers.[113] In the Central Valley, a substantial number of residents rely on groundwater wells for drinking water, but in some communities water supply and

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commenters, the existence of CV-SALTS does not obviate the need for the Central Valley Water Board to adopt waste discharge requirements that have specifically tailored requirements and timelines for each of the various categories of dischargers that participate in any given CV-SALTS management zone.

[110] CV-SALTS, *supra*, pp. 55, 57, 84.

[111] See the detailed discussion about the time schedule in Section III.A.2 of this order.

[112] While nitrate is most common, nitrite concentrations that exceed drinking water standards also pose a health risk because they do not need to be converted by the body to cause harm.

[113] California Department of Public Health, Nitrate Fact Sheet (May 2014) at: <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/wc_13287/fact_sheet_nitrate_may2014_update.pdf> (as of Aug. 22, 2026).

domestic wells do not meet safe drinking water standards due to high nitrate concentrations.[114] Ingestion of nitrate in drinking water poses the greatest human health concerns.[115] Many households in the Central Valley drink or cook with unfiltered tap water, unaware of potential nitrate contamination and the associated risks of adverse health outcomes.[116] However, nitrate-contaminated water can be used for bathing infants and children, as well as for showers, because nitrate is only a concern when ingested and is not absorbed through the skin.[117]

Nitrate can interfere with the ability of red blood cells to carry oxygen to body tissues, leading to a condition known as methemoglobinemia.[118] This is particularly concerning for infants, whose immature stomach environment facilitates the conversion of nitrate to nitrite, which is then absorbed into the bloodstream. This condition, infant methemoglobinemia (often referred to as blue baby syndrome), can occur when infants ingest high levels of nitrite from food or formula made with nitrate-contaminated water.[119,120] Pregnant women may also experience reduced oxygen-carrying capacity of

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[114] Central Valley Salinity Alternatives for Long-Term Sustainability, Brochure *Nitrate Control Program* at: <http://www.cvsalinity.org/wp-content/uploads/2023/12/Nitrate-Control-Program-Brochure-final-11-14-23.pdf> (as of Aug. 22, 2026); see generally Pacific Health Institute, The Human Costs of Nitrate-contaminated Drinking Water in the San Joaquin Valley (March 2011) pp. 34-35, at: <http://pacinst.org/wp-content/uploads/2013/02/nitrate_contamination1.pdf> (as of Aug. 22, 2026).

[115] California Department of Public Health, Nitrate Fact Sheet, *supra*.

[116] The Human Costs of Nitrate-contaminated Drinking Water in the San Joaquin Valley, *supra*, pp. 34-35.

[117] California Department of Public Health, Nitrate Fact Sheet, *supra*.

[118] *Id*.

[119] *Id*.

[120] In their letter commenting on our October 1, 2024, draft order, Stanford Law School's Climate and Energy Policy Program researchers highlighted a preliminary analysis of MediCal data that suggests that certain communities in the Central Valley could be experiencing heightened incidences of blue baby syndrome. Because ingestion of nitrate-contaminated drinking water is a primary cause for blue baby syndrome, the researchers urge immediate action to protect residents whose wells may have high nitrate levels, a significant risk for infants and pregnant women. We conclude that MediCal data, or similar information from medical providers, holds significant promise for future use for prioritizing areas for alternative water supplies. As acknowledged by the researchers, however, the preliminary MediCal data currently has substantial limitations. Most of the data relates generally to cyanotic attacks in all ages due to low oxygen levels from any one of many causes, rather than specifically due to

the blood due to consumption of high nitrate concentrations. The most vulnerable groups are infants under six months and pregnant women, while healthy children and adults generally face the lowest risk of becoming ill.[121]

I. Ex Parte Meetings

After we decided to review the 2013 Dairy General WDRs on our own motion, a group that included representatives of the environmental and environmental justice organizations that had filed the petition, dairy industry representatives, and other interested parties requested that our staff share their preliminary technical recommendations and provide an opportunity for feedback before staff distributed a draft water quality order. They requested staff do so through a series of ex parte meetings between the group and a Board member, since our review of the 2013 Dairy General WDRs is subject to a special statutory provision for ex parte communications related to general waste discharge requirements.[122]

In petition proceedings, ex parte meetings generally are not a forum used to discuss technical issues and receive feedback before the distribution of a draft water quality order and the commencement of the formal public comment period. In this proceeding, however, there was a general recognition that having the meetings would be constructive, in light of the fact that many of the interested parties have familiarity and, in some instances, significant expertise, with the technical issues under consideration, including the variety of manure management practices, operational or cost constraints of those practices, and water quality impacts to sources of drinking

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infant methemoglobinemia. Further, the locational data is based solely on the Medicare recipients' five-digit ZIP codes, each of which can encompass a large geographic area, and, according to the researchers, may not even be where the affected person actually resides. Unfortunately, these limitations make this particular data unsuitable for our use, but we strongly encourage the researchers or others to develop opportunities for medical providers to promptly report locations of incidences of blue baby syndrome in a manner that protects the privacy of the patients.

[121] *Id*.

[122] See Wat. Code, § 13287, subd. (a) & (b) (providing that the ex parte provisions of the Administrative Procedures Act do not apply to specified board actions, including the adoption, modification, or revision of general waste discharge requirements).

water associated with dairy discharges. Board Member Sean Maguire agreed to participate in each of the ex parte meetings.

From September 20, 2021, to May 16, 2022, Board Member Maguire and staff held 14 ex parte meetings. Attendees included petitioners and representatives of the dairy industry, the California Department of Food and Agriculture, the Central Valley Water Board, and environmental and environmental justice organizations. In accordance with the ex parte communication disclosure requirements of Water Code section 13287, the ex parte meetings are disclosed and posted (including topics discussed, written materials used or distributed, and the identity of all meeting participants), on our petition web page.[123] As requested, the meetings were used as an opportunity for staff to receive feedback from the representative stakeholder group to help inform the regulatory framework, including both conceptual and specific proposed requirements described in Section III, before the draft water quality order was distributed for public comment.

II. THE 2013 DAIRY GENERAL WDRS: ISSUES AND FINDINGS

The petition raises numerous legal issues concerning the Central Valley Water Board's adoption of the 2013 Dairy General WDRs, which we address here.

In this discussion, we first address two issues relating to the 2013 Dairy General WDRs' time schedule. Next, we address the 2013 Dairy General WDRs' compliance with the Antidegradation Policy. Lastly, we evaluate the 2013 Dairy General WDRs' consistency with other state laws, Water Code section 106.3, commonly referred to as the human right to water statute, and Government Code section 11135, the state antidiscrimination law.

The 2013 Dairy General WDRs were issued under the authority of the Porter-Cologne Act, specifically Water Code section 13263. Section 13263 requires the Central Valley Water Board to set waste discharge requirements that implement relevant water

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[123] The disclosed communications are at: <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wc_13287_disclosures.html> (as of Aug. 22, 2026). All of the documents used during the ex parte meetings and disclosed on our petition web page are part of the administrative record for this proceeding. See fn. 67, *ante*.

quality control plans.[124] The 2013 Dairy General WDRs must implement the Basin Plans, which identify the beneficial uses of the surface waterbodies and groundwater in the region and identify the water quality objectives to be achieved to reasonably support the beneficial uses of those waters.

The 2013 Dairy General WDRs must also comply with State Water Board policies for water quality control.[125] Especially relevant to this proceeding are the Nonpoint Source Policy[126] and the Antidegradation Policy. Water Code section 13267 authorizes the Central Valley Water Board to require monitoring and reporting as a component of the 2013 Dairy General WDRs. The Nonpoint Source Policy additionally directs that any nonpoint source control implementation program incorporates monitoring and reporting requirements.

A. Compliance with the Water Code and the Nonpoint Source Policy

We begin our review of the petition with consideration of the 2013 Dairy General WDRs' consistency with the Water Code in light of the direction provided in the Nonpoint Source Policy as to how to effectuate Water Code requirements in the context of control of nonpoint source discharges.[127]

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[124] Wat. Code, § 13263, subd. (a).

[125] *Id*., § 13146, State Water Board Order WQ 2018-0002, p. 11.

[126] The 2013 Dairy General WDRs do not explicitly acknowledge that the Central Valley Water Board considered the Nonpoint Source Policy. (See 2013 Dairy General WDRs, Information Sheet, pp. IS-5 to IS-22 (recognizing generally that the Basin Plans must conform to statewide policies but not explicitly acknowledging that the Nonpoint Source Policy was considered).)

[127] In its letter commenting on our October 1, 2024, draft order, Rosemont Advocates For a Clean/Safe Environment contends that, because dairies are "concentrated animal feeding operations" which are "point source discharges" within the meaning the Code of Federal Regulations, title 40, part 122.2, dairy discharges to groundwater that impair beneficial uses must be required to "cease and desist the discharge of waste through immediate regulatory action available." The cited federal regulations apply to discharges to United States surface waters subject to National Pollutant Discharge Elimination System permits not at issue here. The 2013 Dairy General WDRs are not NPDES permits and do not authorize discharges of dairy waste to waters of the United States. (*Id.*, p. 12, fn. 1; *id*., Information Sheet, IS-1.) The 2013 Dairy General WDRs contain various prohibitions against dairy waste discharges to surface waters. (*Id*., pp. 12-13, prohibitions A.3, A.10 – A.12.)

Water Code section 13260 requires persons "discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" to file a ROWD. Water Code section 13263, subdivision (d), provides that regional water boards may prescribe waste discharge requirements even if a ROWD has not been filed. The 2013 Dairy General WDRs recite that dairy waste includes, but is not limited to, "manure, leachate, and any water, precipitation, or rainfall that contacts raw materials, products, or byproducts such as manure, compost piles, feed, silage, milk or bedding."[128] Dairy manure discharges that can affect the quality of groundwater include the application of dairy manure to dairy cropland, the discharge of dairy manure to land in production areas, and the discharge of dairy manure to manure retention ponds. Water Code section 13263 in turn directs a regional water board to prescribe requirements for the discharge that "implement any relevant water quality control plans and policies that have been adopted, and that [. . .] take into consideration beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisance," as well as certain additional factors, including economic considerations. A regional water board may prescribe general waste discharge requirements to a category of discharges, such as milk cow dairy discharges, rather than issue individual waste discharge requirements to separate dairies.[129]

While waste discharge requirements require compliance with the water quality objectives specified in the water quality control plans, such compliance need not be achieved immediately. A time schedule for compliance with water quality requirements is explicitly permitted by Water Code section 13263, subdivision (c), which states that waste discharge requirements "may contain a time schedule subject to revision in the discretion of the [regional water] board."

The Nonpoint Source Policy provides guidance on the proper interpretation and implementation of the Water Code requirements, including sections 13263 and 13267, in the context of regulating nonpoint source discharges. The Nonpoint Source Policy generally anticipates the use of management practice implementation to control

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[128] *Id.*, Information Sheet, p. IS-24.
[129] Wat. Code, § 13263, subd. (i).

pollution from nonpoint sources but specifies that a nonpoint source control pollution control implementation program must satisfy five Key Elements to meet the regional water board's obligations to protect water quality.[130]

Key Element 3 of the Nonpoint Source Policy provides that where a regional water board determines time should be allowed for discharges to achieve water quality requirements, the regional water board must specify a time schedule to achieve those requirements, and corresponding quantifiable milestones designed to measure progress toward reaching the specified requirements.

In the two Sections that follow, we discuss the 2013 Dairy General WDRs' time schedule for dairies to achieve the Groundwater Limitation and allowance for dairies to request an extension to the time schedule.

1. The Length of the 16-year Time Schedule

The time schedule provides up to 16 years[131] for dairies to comply with the Groundwater Limitation. An iterative process is used for individual or representative

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[130] Nonpoint Source Policy, p. 11; *Monterey Coastkeeper v. State Water Resources Control Bd. (2018)* 28 Cal.App.5th 342, 349. Nonpoint source implementation programs for pollution control must include five Key Elements: (1) explicitly state the program's ultimate purpose which, at a minimum, must be to address nonpoint source pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements; (2) describe the management practices and other nonpoint source control implementation program elements that are expected to be implemented and the process for ensuring their proper implementation; (3) include a specific time schedule and corresponding quantifiable milestones designed to measure progress toward reaching the specified water quality requirements; and (4) include sufficient feedback mechanisms to determine if the program is achieving its stated purpose. (Nonpoint Source Policy, pp. 11-14.) The fifth Key Element states, "Each [regional water board] shall make clear, in advance, the potential consequences for failure to achieve a nonpoint source control implementation program's stated purpose." (*Id*. at p. 14.)

[131] 2013 Dairy General WDRs, p. 23, fn. 6, § F.1, pp. 28-29, § M. The 16-year timeframe is a rough approximation of the total time to implement the findings of the groundwater studies implemented by a representative monitoring program: six years of annual studies and reports followed by implementation as soon practicable but no longer than ten years of the executive officer's approval of the summary representative monitoring report. The 16-year estimated timeframe does not include the time in which the executive officer takes to review and approve a summary report and does not

monitoring efforts to initially study the baseline water quality regarding existing management practices to control discharges from production areas, existing manure retention ponds, and land application areas. If, according to the six-year study's summary report, a dairy's management practices for any of the categories of dairy waste discharges are determined to not protect groundwater quality, the dairy must identify additional, new or revised control requirements to comply with the Groundwater Limitation. The new or upgraded protective management practices must be implemented as soon as practicable, but not more than ten years from the Central Valley Water Board Executive Officer's approval of the individual summary report or the summary representative monitoring report.[132]

Petitioners contend the length of the time schedule is unlawful. Petitioners point out that the 16 years of continued degradation follows a continuous line of deferrals that have allowed the dairy industry to pollute the groundwater in the entire Central Valley region.

The Water Code and the Nonpoint Source Policy recognize there are circumstances where it will take time to achieve water quality requirements.[133] The Nonpoint Source Policy explains that a regional water board has the discretion to determine the length of the time schedule with consideration of the time necessary to achieve water quality requirements. It describes numerous tasks and circumstances that could reasonably require time, many of which are included in the time schedule's iterative process: the need to identify baseline water quality conditions, the sufficient collection of data to identify practices that would be protective of water quality, and implementation of those practices determined to be protective. However, a time schedule may be no longer than that reasonably necessary to achieve applicable water quality objectives.[134]

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include any additional time needed if the executive officer disapproves the summary report.

[132] *Ibid.*

[133] Wat. Code, § 13242, subd. (b), 13263, sub. (c); Nonpoint Source Policy, p. 13, Key Element 3.

[134] Nonpoint Source Policy, p. 13, Key Element 3.

The Information Sheet accompanying the 2013 Dairy General WDRs explains the initial, six-year monitoring period is needed to determine the effectiveness of existing practices. Due to the time lags between surface practices and resulting effects in groundwater, the Central Valley Water Board determined six years was needed to develop an adequate data set for statistical evaluation and up to ten years for dairies to subsequently make necessary improvements and implement more protective management practices, if needed.[135] Together, these constitute reasonable interim actions and milestones, consistent with the Nonpoint Source Policy's Key Element 3.

We conclude that the 16-year time schedule for the actions dairies are required to take to comply with the 2013 Dairy General WDRs' Groundwater Limitation was reasonably justified and, therefore, is consistent with Key Element 3 of the Nonpoint Source Policy. In assessing the reasonableness of the time schedule's length, we must look forward to the effort required by the 2013 Dairy General WDRs—and not backwards to the missed opportunities as petitioners urge.

Looking forward in time to the development of the revised dairy waste discharge requirements, however, the CVDRMP's SRMR acknowledges that, based on its findings, implementation of its recommended near-term management practices will not result in compliance with the Groundwater Limitation and asserts that it is not realistic to achieve the Groundwater Limitation within the remaining ten years of the 16-year time schedule specified in the 2013 Dairy General WDRs. We discuss in greater detail at Section I.F the CVDRMP's rationale for its conclusion that meeting the Groundwater Limitation industry-wide will take a significant amount of time and will require, at a minimum, the development of a manure market at a sufficient scale that does not exist today. We also explain in Section III that we find these conclusions to be sound and agree that compliance for existing dairies must be phased in over time. Accordingly, as part of the regulatory framework for nitrogen discharges established by this order in Section III, we direct the Central Valley Water Board to adopt a time schedule that is consistent with the Nonpoint Source Policy and with CV-SALTS.

[135] 2013 Dairy General WDRs, Information Sheet, p. IS-31.

2. The Extension of Time Available to Comply with the Groundwater Limitation

The 2013 Dairy General WDRs' time schedule allows dairies participating in the representative monitoring program to request the Central Valley Water Board to grant an extension of time for any of the compliance dates, including the April 2029 final compliance deadline for members of the CVDRMP to meet the Groundwater Limitation (16 years from April 2013), upon a dairy demonstrating that meeting the deadline "is technically or economically infeasible."[136]

Petitioners express the concern that the Central Valley Water Board could reach a conclusion of "economic infeasibility" or "impracticability" in connection with dairies implementing management practices to comply with the Groundwater Limitation, particularly with respect to existing manure retention ponds. Petitioners' concern stems from the Central Valley Water Board's justification underlying its decision to rule out the immediate retrofitting of existing manure retention ponds with liners. In that instance, the Central Valley Water Board determined that immediate retrofitting would be cost prohibitive for most dairies.[137] In essence, petitioners suggest the extension available may be utilized by dairies to postpone implementation of liners in perpetuity, thus rendering the final compliance deadline impermissibly indefinite.

Pointing to the time schedule's iterative approach for the implementation of protective management practices, the Central Valley Water Board and dairy industry representatives respond that petitioners' argument is based on unfounded fears and assert that retrofitting or liner options for existing manure retention ponds could be required.[138] Indeed, the 2013 Dairy General WDRs make a finding that if it is determined that existing ponds are not protective of underlying groundwater they will be required to be upgraded or replaced.[139]

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[136] *Id.*, p. 23, fns. 6, 7 and accompanying text, p. 29, § M.

[137] *Id.*, p. 9, Finding ¶ 28.c; *id.*, Information Sheet, IS-18 to IS-19.

[138] Note that these responses were filed prior to the CVDRMP's completion of its SRMR.

[139] *Id.*, p. 9, Finding ¶ 28.c.

We find petitioners' contention has merit. In rejecting a requirement that existing manure retention ponds be immediately retrofitted with liners, the Central Valley Water Board already concluded, "[i]f forced to retrofit such lagoons, many dairy operations would likely go out of business."[140] While this statement related to immediate liner retrofits, there is no indication in the record that the liner retrofits are likely to become more economically feasible in the future. While other protective management practices for existing manure retention ponds could be devised and implemented during the time schedule's iterative process, liner requirements were the only treatment or control measures anticipated to meet water quality requirements identified in the administrative record.[141] Thus, the future granting of long, or sequential, time extensions has a ring of inevitability. And given the CVDRMP's SRMR's subsequent conclusions about the feasibility and expense of tier 1 and tier 2 liners for existing manure retention ponds,[142] the petitioners' concerns appear to be well-founded.

Additionally, Key Element 3 of the Nonpoint Source Policy explicitly requires a *specific* time schedule to be included when water quality requirements are not immediately effective.[143] The purpose of establishing a specific time schedule is to assure that water quality objectives are met by a date certain. As written (and regardless of whether the source of discharge is from an existing manure retention pond or some other dairy manure discharge location), the indeterminate allowance for an extension to the time schedule is impermissibly vague and not specific. Purporting to limit the overall compliance deadline to 16 years, but simultaneously providing, without limitation, that any of its compliance dates may be extended if the discharger provides evidence that meeting the compliance date is technically or economically infeasible, is effectively no deadline at all. While a regional water board may amend a revised time schedule or adopt a compliance schedule in an enforcement order, the 2013 Dairy

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[140] *Id.*, Information Sheet, p. IS-18.
[141] *Id.*, Information Sheet, p. IS-18.
[142] CVDRMP Summary Representative Monitoring Report, pp. 58-59, § 2.8.
[143] The Central Valley Water Board has discretion to later determine whether a time schedule should be adjusted and "may make further amendments to the time schedule or issue an enforcement order that contains a compliance schedule." (Nonpoint Source Policy, p. 13.)

General WDRs' inclusion of the broad extension opportunity in the time schedule without specifying the maximum duration of the allowable time extension is the sort of open-endedness rejected in *Monterey Coastkeeper v. State Water Resources Control Board* (2018) 28 Cal.App.5th 342.[144]

Accordingly, the time schedule suffers from a lack of specificity and therefore fails to comply with the Water Code and the Nonpoint Source Policy. We direct the Central Valley Water Board to ensure that all time schedules, including any allowances for extensions, in the revised dairy general waste discharge requirements contain a specific time schedule for dairies to comply that is as short as practicable and is consistent with CV-SALTS and the Nonpoint Source Policy.

B. Compliance with the Antidegradation Policy

The Antidegradation Policy is a state policy for water quality control that establishes the requirement that discharges to high quality waters of the state shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the State.[145] The baseline water quality for determining whether a water of the state is "high quality water" is not necessarily the water quality conditions as they exist at the time that that the discharges are authorized. Rather, the baseline is the best quality of the water since 1968, the year the Antidegradation Policy was adopted, or a lower level if that lower level was authorized through a permitting or other regulatory action consistent with the federal antidegradation policy, if applicable, and the

[144] In determining that the waiver for irrigated lands issued by the Central Coast Regional Water Quality Control Board, which we subsequently modified, failed to comply with the Nonpoint Source Policy, the Court explained that the Nonpoint Source Policy "*expressly* requires time schedules; the purpose is to assure that the water quality objectives are eventually met," and for the waiver "to delay, diminish, or dilute a requirement that is part of the [Nonpoint Source Policy] is improper." (*Monterey Coastkeeper, supra*, 28 Cal.App.5th at pp. 369-370.)

[145] State Water Board Resolution No. 68-16, ¶ 1.

Antidegradation Policy.[146] A permit authorizing a lowering of high quality water must contain certain findings to comply with the Antidegradation Policy.[147]

As noted in Section I.C of this order, the 2013 Dairy General WDRs rescind and replace the 2007 Dairy General WDRs and are intended to comply with *AGUA*.[148] *AGUA* held that because the dairy waste discharges to groundwater in the Central Valley region permitted by the 2007 Dairy General WDRs would degrade at least some high quality waters, the 2007 Dairy General WDRs must comply with the Antidegradation Policy.[149]

In a 1995 staff guidance memorandum (Staff Guidance Memorandum), our staff explained that compliance with the Antidegradation Policy requires consideration of the following two-step analysis:

> The first step is if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality (1) will be consistent with maximum benefit to the people of the State, (2) will not unreasonably affect present and anticipated beneficial use of such water, and (3) will not result in water quality less than that prescribed in state policies (e.g. water quality objectives in Water Quality Control Plans). The second step is that any activities that result in discharges to such high quality waters are required to use the best practicable treatment or control of the discharge necessary to avoid a pollution or nuisance and to maintain the highest water

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[146] *AGUA*, *supra*, 210 Cal.App.4th at p. 1270 (citing State Water Board management's directions to staff for implementing the state and federal antidegradation policies for the NPDES permitting program, Administrative Procedures Update, APU-90-004 (July 2, 1990), p.4 (State Water Board APU) and finding it instructive for comparing baseline water quality to water quality objectives to determine whether the Antidegradation Policy applied to the discharge).

[147] *AGUA*, *supra*, 210 Cal.App.4th at p. 1278.

[148] 2013 Dairy General WDRs, Information Sheet, IS-11.

[149] *AGUA*, *supra*, 210 Cal.App.4th at pp. 1279, 1284. *AGUA* concluded that at least some of the water affected by the 2007 Dairy General WDRs is high quality water because there was evidence that some groundwater nitrate levels in 1986 were below the water quality objective of 10 mg/L. Thus, an antidegradation analysis was required because the 2007 Dairy General WDRs authorized discharges that would cause degradation of that high quality water. The 2007 Dairy General WDRs did not include an antidegradation analysis, so they could not have authorized a lowering of high quality waters consistent with the Antidegradation Policy. Because we conclude below that the 2013 Dairy General WDRs did not include an appropriate antidegradation analysis, the appropriate baseline for antidegradation purposes is the estimated groundwater quality as of 1968.

> quality consistent with the maximum benefit to the people of the State.[150]

In the Information Sheet accompanying the 2013 Dairy General WDRs, the Central Valley Water Board includes a discussion of the requirements of the Antidegradation Policy, a summary of the *AGUA* decision, related guidance, including that set forth above, and an analysis of the requirements to comply with the Antidegradation Policy for each of the primary sources of dairy manure discharges to groundwater.[151]

Petitioners assert the Central Valley Water Board's antidegradation analysis is insufficient concerning items one and three under the first step quoted above, the mandate that an authorized lowering of high quality water be consistent with the maximum benefit to the people of the state, and that the lowering of high quality water not result in water quality less than that specified by water quality objectives. We take this opportunity to provide further statewide guidance on the interpretation and application of our Antidegradation Policy for all Water Boards in the next Section (II.B.1).

1. Maximum Benefit

Petitioners contend the 2013 Dairy General WDRs fail to include the requisite complete analysis to support the Central Valley Water Board's finding[152] that

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[150] State Water Board Guidance Memorandum ("Questions and Answers" re Resolution 68-16) (Feb. 16, 1995) (Staff Guidance Memorandum); *AGUA*, *supra*, 210 Cal.App.4th at p.1278 (quoting the Staff Guidance Memorandum at p. 2).

[151] See discussion in the 2013 Dairy General WDRs Information Sheet, at pages IS-9 through IS-22.

[152] The 2013 Dairy General WDRs' "maximum benefit" finding provides in relevant part,

> 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

degradation to high quality waters will be consistent with maximum benefit to the people of the State.

To evaluate whether a lowering of high quality water quality will be consistent with "maximum benefit to the people of the State," the Staff Guidance Memorandum explains that the

> determination is made on a case-by-case basis and is based on considerations of reasonableness under the circumstances at the site. Factors to be considered include … economic and social costs, tangible and intangible, of the proposed discharge compared to the benefits. … With reference to economic costs, both costs to the discharger and the affected public must be considered.[153]

The Central Valley Water Board asserts that its "maximum benefit" finding is sufficient, particularly considering that the 2013 Dairy General WDRs also contain the general finding that it is "designed to protect human health and ensure that water is safe for domestic use,"[154] and should be upheld. However, petitioners do not challenge the adequacy of the finding in and of itself. Petitioners challenge the adequacy of the analysis to support the finding. Petitioners argue that the analysis fails to consider the costs, tangible and intangible, to the affected public reliant on groundwater for drinking water supplies.

The Information Sheet to which the 2013 Dairy General WDRs' "maximum benefit" finding refers focuses solely on what the costs would be to the dairies and the dairy industry overall, and how those costs would have regional and statewide economic impacts, if existing manure retention ponds had to be immediately retrofitted with a liner. Specifically, the Information Sheet cites two memoranda discussing the costs dairies would incur if required to immediately retrofit existing ponds with a liner option to conclude such a requirement would be beyond economically practicable for

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> 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.

(2013 Dairy General WDRs, p. 10, Finding ¶ 33.)

[153] Staff Guidance Memorandum, *supra*, fn. 150, at pp. 4-5.

[154] 2013 Dairy General WDRs, p. 11, Finding ¶ 38.

most dairies, so many dairies would close, and widespread economic impacts would occur, including loss of jobs and local economy benefits.[155]

Petitioners correctly point out that absent from the analysis is any consideration of potential costs to individuals reliant on the quality of the groundwater, the social costs to impacted communities, or the environmental costs associated with further lowering of water quality from ongoing discharges from the existing manure retention ponds. As examples, petitioners observe that the 2013 Dairy General WDRs lack any analysis of costs incurred by individuals, water providers, or the state to clean up or treat water contaminated by the discharges or to provide replacement water, or of health impacts suffered by individuals or the community at large from drinking nitrate contaminated water.

The Staff Guidance Memorandum was not developed in accordance with state rulemaking requirements, so it cannot be binding on the regional water boards on its own. And while *AGUA* quoted it at length, it did not rely on any unique provisions of the Staff Guidance Memorandum for any of its holdings or conclusions. Further, certain portions of the Staff Guidance Memorandum were taken directly from the federal antidegradation regulations applicable only to point source discharges. Nonetheless, we agree with petitioners that social and economic costs to impacted communities associated with degradation of high quality water from discharges of manure must also be considered in a maximum benefit analysis.[156] On remand, the Central Valley Water

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[155] *Id*., Information Sheet, p. IS-18 (citing Memorandum from John Schaap, Provost & Pritchard, to Theresa A. Dunham, Somach, Simmons & Dunn ("Costs to retrofit existing dairies that do not have tier 1 or tier 2 lagoons"), Aug. 5, 2013, and Memorandum from Annie AcMoody, Western United Dairymen, to Theresa A. Dunham, Somach, Simmons & Dunn ("Financial Impact to Retrofit Dairies that do not have Tier 1 or Tier 2 Lagoons"), Aug. 6, 2013). We need not determine whether the discussion in the memoranda supports the corresponding conclusions in the Information Sheet.

[156] Petitioners assert costs that may be incurred by individuals or water providers for treatment of contaminated water are within the proper scope of consideration and point out that such costs could be incurred where the authorized water quality is set to just meet water quality objectives. Petitioners reason that public water systems conduct treatment when the source water quality is at or just below water quality objectives to ensure fluctuations in the source water quality do not result in exceedances of water quality standards, and they incur extra monitoring costs when the source water exceeds 50 percent of the nitrate MCL. (Petition, p. 11, fn. 3.) We agree with petitioners.

Board's maximum benefit findings must be supported by a more meaningful, programmatic analysis of readily available information and data. This evaluation should be a generalized, high-level review consistent with the revised waste discharge requirements' corresponding programmatic environmental analysis, rather than an exhaustive, site-specific review. To achieve this, the Central Valley Water Board must address the additional economic and social costs associated with the discharges of dairy manure to high quality waters, using information already in its possession or provided to it.[157] Doing so prevents the dairy industry's potential avoided manure management costs associated with allowing groundwater degradation from being evaluated in isolation from the significant costs borne by the community reliant on groundwater for drinking water supplies. We describe the range of relevant economic and social costs at Section III.E of this order. While this direction is given specifically to the Central Valley Water Board, our interpretation of what is required to apply the Antidegradation Policy generally applies to all other regional water boards when evaluating whether a lowering of high quality water is to the maximum benefit to the people of the state.[158]

Finally, we note that the analysis in the Information Sheet only evaluates costs associated with dairies controlling discharges from existing manure retention ponds (with various types of liner options), and not from the other primary sources of dairy discharges to groundwater. The Central Valley Water Board's maximum benefit analysis must also encompass the dairy industry's potential avoided costs, and the affected public's economic and social costs, associated with any lowering of high quality groundwater from the other principal sources of dairy discharges of manure to groundwater.

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[157] See, e.g., *Environmental Law Foundation v. State Water Resources Control Bd.* (2023) 89 Cal.App.5th 451, 496 as modified (Apr.13, 2023), review denied (June 14, 2023).

[158] To be clear, not every regional water board action that would authorize a lowering of high quality waters will involve the same categories of social or economic community costs identified in the Central Valley record. Each permitting action should evaluate only those costs and impacts that are reasonably foreseeable, relevant, and supported by the record for the particular discharge and receiving water.

2. Water Quality Less than Applicable Water Quality Objectives

Waste discharge requirements subject to the Antidegradation Policy must be designed to ensure that "existing high quality will be maintained until it has been demonstrated to the State that any change … will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than [water quality objectives]."[159]

Petitioners assert generally that the Antidegradation Policy requires that any authorized lowering of high quality water be accompanied with a demonstration that the lowering will not result in a violation of water quality objectives. Petitioners point to the time schedule as evidence that the 2013 Dairy General WDRs excuse the requirement to immediately comply with the Groundwater Limitation.

We addressed this issue, in part, in Order WQ 2018-0002. We explained there that it was more appropriate to evaluate a contention regarding waste discharges resulting in water quality less than that specified in water quality objectives with respect to compliance with the Water Code[160] and the Nonpoint Source Policy,[161] rather than the Antidegradation Policy, because the underlying obligation to implement the water quality objectives derives from Water Code section 13263, as augmented by Key

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[159] State Water Board Resolution No. 68-16, Resolved ¶ 1; Staff Guidance Memorandum, *supra*, fn. 150, at p. 6, no. 8 (explaining that "not unreasonably affect present and anticipated beneficial use of water" as used in the Antidegradation Policy means "at a minimum require compliance with the water quality objectives") and pp. 6-7, no. 9 (describing "water quality control policies" referred to in the Antidegradation Policy as including water quality objectives established in water quality control plans).

[160] See Wat. Code, § 13263 (directing the regional water boards to prescribe water quality requirements for the discharge that "implement any relevant water quality control plans" taking into account other considerations, including applicable "water quality objectives reasonably required for that purpose").

[161] See Nonpoint Source Policy, pp. 11-12, Key Element 1, stating:

> An NPS [nonpoint source] control implementation program's ultimate purpose shall be explicitly stated. Implementation programs must, at a minimum, address NPS [nonpoint source] pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.

Element 1 of the Nonpoint Source Policy.[162] We also explained (as we did in Section II.A.1 above) that while waste discharge requirements must require compliance with applicable water quality objectives, such compliance need not be achieved immediately, or at each discrete point in time and space, due to different considerations including time schedules, mixing zones, averaging periods, or other strategies authorized by the Water Code and the Nonpoint Source Policy.[163]

We take this opportunity to elaborate on that concept as it relates to the Antidegradation Policy, which permits degradation of high quality waters if, as pertinent here, it does not result in water quality less than prescribed in policies, which are construed in light of the Water Boards' implementation authorities, including time schedules.

Again, the Water Code does not require waste discharges to immediately implement water quality objectives. Water Code section 13263, subdivision (c), clearly authorizes a water board to establish a time schedule for waste discharges to eventually implement water quality objectives over a specified period of time that is as short as practicable if immediate implementation of the applicable water quality objectives is not feasible. If the waste discharge is to water that already exceeds applicable water quality objectives, like the groundwater beneath all of the dairies that were monitored by the CVDRMP's representative monitoring program, then the result of the time schedule is that those waste discharges will likely continue to cause or contribute to the exceedances of water quality objectives in the groundwater during the time schedule. If, however, there is no high quality water affected by the waste discharge, the Antidegradation Policy simply does not apply to the situation.[164]

The Antidegradation Policy does come into play, on the other hand, if the waste discharge can affect high quality water. Even though it applies, the Antidegradation Policy's provision precluding changes to high quality waters that result in water quality less than the applicable water quality objectives does not require anything more than Water Code section 13263 already requires. Further, the Antidegradation Policy does

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[162] State Water Board Order WQ 2018-0002, pp. 12-15, § II.A.
[163] *Ibid*.
[164] *AGUA*, *supra*, 210 Cal.App.4th at p. 1278.

not explicitly or implicitly override a water board's authority and discretion under the Water Code to determine how to structure waste discharge requirements to ensure the relevant water quality control plan's water quality objectives are implemented. Neither could it restrict the Water Boards' statutory authority to grant time schedules under the later-enacted Water Code section 13263, subdivision (c).[165] The result of a time schedule for a waste discharge to high quality water may well be a protracted but temporary interim lowering of the high quality water to a level less than that required to meet water quality objectives even where the Antidegradation Policy applies. The practical effect of granting a time schedule is that the waste discharge that is allowed to continue to degrade high quality waters may also cause those waters to temporarily exceed water quality objectives. While we would obviously prefer to be able to require all existing dischargers to implement measures that immediately achieve water quality objectives, it simply is not technically and economically feasible in all cases. Because

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[165] While not directly relevant to disposition of this matter, we note that discharges pursuant to the federal Clean Water Act's NPDES permit program (33 U.S.C. § 1342) are subject to other limitations on compliance schedules. For NPDES discharges in California, the State Water Board has established a compliance schedule policy that authorizes and limits the circumstances in which compliance schedules are authorized. (State Water Board Resolution No. 2008-0025.) The limitations in the compliance schedule policy include not allowing compliance schedules for new dischargers, or for numeric water quality objectives for pollutants previously known to be in existing dischargers' effluent. Similarly, provisions of water quality control plans and state policies for water quality control may further enable and limit the use of compliance schedules.

We note that the terms "compliance schedule" and "time schedule" are not always clearly defined. In the NPDES permitting context, a compliance schedule generally refers to one or more provisions in an NPDES permit that include a set period of time before the discharge must comply with final requirements that are protective of water quality. In this order, we use "time schedule" in the context of waste discharge requirements for nonpoint source discharges to mean the general equivalent of an NPDES permit's compliance schedule. There is a different concept that often uses the same or similar terms to refer to provisions in an enforcement order (e.g., a time schedule order issued under Water Code section 13300 or 13308 or a cease and desist order issued under Water Code section 13301) that include a set period of time during which the discharger must take specified steps to come into compliance with final requirements that are protective of water quality, but where those final requirements are already in effect in the discharger's NPDES permit or waste discharge requirements—and are being violated. This enforcement order concept is not implicated by our discussion in this Section or elsewhere in this order.

the interim lowering will ultimately be reversed by the same permitting action, the interim lowering is not inconsistent with the Antidegradation Policy. We recognized this in 2004 when we adopted the Nonpoint Source Policy:

> Current land use management practices that have resulted in NPS pollution have a long and complicated physical, economic and political history. In addition to the need for resources, forging a new history of pollution control will take time and commitment, as well as a willingness to examine the use of practices that have resulted in current NPS pollution discharges and the barriers to change. Therefore, it is expected that it will take a significant amount of time for the RWQCBs to approve or endorse NPS control implementation programs throughout their regions, and even longer for those programs to achieve their objectives.[166]

Importantly, while the Nonpoint Source Policy requires compliance with the Antidegradation Policy, it also acknowledges that it may take a significant amount of time for dischargers to implement water quality objectives where groundwater has been degraded by historic practices by the same or similar dischargers, and achieving water quality objectives requires phased implementation over time.[167] That framework implicitly recognizes that compliance with the Antidegradation Policy does not prohibit interim reductions in water quality, even those beyond water quality objectives.

For this reason, on remand, and consistent with the direction we provide in this order, the Central Valley Water Board may establish a time schedule in the revised dairy general waste discharge requirements that results in a temporary lowering of high quality water consistent with the Antidegradation Policy.

C. Compliance with Other State Laws

1. The Human Right to Water Statute

Petitioners assert the 2013 Dairy General WDRs fail to comply with the human right to water statute, Water Code section 106.3. By its express terms, the statute applies to policies, regulations, and grants; it does not apply to the Central Valley Water

[166] Nonpoint Source Policy, p. 16.
[167] Nonpoint Source Policy, pp. 11-14.

Board's issuance of the 2013 Dairy General WDRs (or to the State Water Board's review of same).[168]

In precedential orders, however, the State Water Board has recognized the appropriateness of addressing the human right to water when acting on water quality orders.[169] Additionally, in 2016, the State Water Board recognized the right and adopted it as a core value and top priority for the State Water Board to consider in activities that could affect existing or potential sources of drinking water.[170] In the introduction to Section III and in Section III.F, we explain that that the foundational objective of the new regulatory framework for nitrogen discharges established by this order is to ensure dairy discharges cease to cause or contribute to concentrations of nitrate in groundwater that exceed the nitrate water quality objective. It should also be noted that, as discussed in the next section, we are making significant strides in administering programs to address the challenges faced by communities lacking access to safe drinking water.

On April 21, 2016, after the Central Valley Water Board adopted the 2013 Dairy General WDRs, it too adopted the human right to water as a core value and committed to consider the right when taking actions that could affect existing or potential sources of drinking water, including permitting decisions.[171] On remand, we expect the Central

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[168] In their letter commenting on our October 1, 2024, draft order, petitioners (and others) disagree with our interpretation that section 106.3 is inapplicable to the issuance of general waste discharge requirements and our review of them. They reason that because general waste discharge requirements are "orders" and "rules" that implement, interpret, and make specific applicable water quality laws, they fall under the definition of a "regulation" under the Administrative Procedures Act (Gov. Code, § 11342.600) and thus come with the scope of section 106.3. We continue to believe section 106.3 is not directly applicable to the adoption or our review of waste discharge requirements, even if they are characterized as "orders" or "rules." The Legislature has maintained a distinction between the Water Boards' quasi-legislative and quasi-adjudicatory functions. Indeed, the Legislature has expressly exempted the issuance of waste discharge requirements from the rulemaking provisions of the Administrative Procedures Act, as petitioners acknowledge. (Govt. Code, § 11352, subd. (b).)

[169] See State Water Board Order WQ 2018-0002, p. 62; State Water Board Order WQ 2013-0101, pp. 67-68.

[170] State Water Board Resolution No. 2016-0010, Resolved ¶¶ 1 & 2.

[171] Central Valley Water Board Resolution R5-2016-0018, Resolved ¶¶ 1 & 2. In Resolution R5-2016-0018, the Central Valley Water Board provided specific direction for its staff to undertake to further the realization of the human right to water, including, and as applicable to the 2013 Dairy General WDRs: when submitting a recommendation to

Valley Water Board will undertake any relevant actions described in Central Valley Water Board Resolution R5-2016-0018 to ensure the human right to water is meaningfully considered in the development of the revised dairy general waste discharge requirements.

2. The State's Antidiscrimination Law

Petitioners contend the 2013 Dairy General WDRs violate the state's antidiscrimination law because it disproportionately impacts low-income communities and communities of color already suffering from high levels of nitrate in their drinking water, inadequate access to health care, and inadequate drinking water supplies. The State Water Board takes these concerns seriously. However, the existence of longstanding water quality disparities does not, by itself, establish that facially neutral general waste discharge requirements unlawfully discriminate under the state antidiscrimination law.[172]

The state's antidiscrimination law prohibits a state agency program from discriminating based on race, ethnicity, national origin, and color, among other immutable characteristics.[173] Where a state law is facially neutral (i.e., not intentionally discriminatory), like the 2013 Dairy General WDRs, the law is nevertheless deemed impermissibly discriminatory if it has an adverse disparate impact on members of a protected class.[174]

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the board implicating the human right to water, describe how the right was considered; as resources allow, meaningfully engage with communities that lack adequate, affordable, or safe drinking water, including providing community outreach; and evaluate the extent to which a proposed action pertinent to the right has been developed with meaningful engagement of impacted communities. (Central Valley Water Board Resolution, R5-2016-0018, Resolved ¶¶ 7-9.)

[172] Gov. Code, § 11135.

[173] *Ibid*. "Low-income" is not a class protected under the antidiscrimination law.

[174] *Guz v. Bechtel Nat'l, Inc*. (2000) 24 Cal.4th 317, 354, fn. 20. A disparate impact claim is analyzed by a burden-shifting framework: (1) the plaintiff has the initial burden to establish that the facially neutral practice causes a disproportionate adverse effect on a protected class; (2) the defendant may overcome that showing by justifying the practice; and (3) the plaintiff may nevertheless prevail by establishing less discriminatory practices. *Darensburg v. Metropolitan Transp. Com*. (9th Cir. 2011) 636 F.3d 511, 519 (utilizing the parallel federal law as guidance to evaluate a state disparate impact claim under Government Code section 11135).

In support of their argument, petitioners cite generally to a report[175] and a research study[176] that explain that Latino and low-income communities are more likely to have contaminated drinking water in the Central Valley region, often due to groundwater nitrate contamination. Both cited documents, while relevant to understanding the historical and ongoing groundwater quality challenges, do not analyze the incremental impacts of the 2013 Dairy General WDRs; they were published years before the 2013 Dairy General WDRs were adopted and neither is particularly relevant to whether the 2013 Dairy General WDRs violate the state's antidiscrimination law.

To demonstrate unlawful disparate impact, petitioners would need to show that the 2013 Dairy General WDRs itself results in a materially greater adverse effect on protected communities than on other similarly situated users of groundwater for drinking water. Petitioners do not present any argument nor provide any direct evidence that the 2013 Dairy General WDRs create a disproportionate, adverse impact on Latinos (or low-income) communities reliant on groundwater for consumption as compared with other residents reliant on the same groundwater for drinking water supplies.

The Central Valley Water Board and the interested parties assert that a recitation of facts of living conditions encountered by a population of residents does not provide the requisite evidentiary support for a claim of discriminatory effect. They also argue the 2013 Dairy General WDRs' purpose is to protect water quality, not effectuate a disproportionate adverse impact on communities of a protected class. We agree. The 2013 Dairy General WDRs aim to implement the Basin Plans to protect groundwater from ongoing and future discharges of dairy manure, through uniform requirements applicable to dairies in the Central Valley based on discharge risk to groundwater, and the effects of the time schedule to implement the requirements and changes in nitrate

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[175] Environmental Justice Coalition for Water, *Thirsty for Justice: A People's Blueprint for California Water* (2005), at <http://www.scribd.com/document/77576133/Thirsty-for-Justice-A-People-s-Blueprint-for-California> (as of Aug. 22, 2026).

[176] Carolina Balazs, et al., *Social Disparities in Nitrate Contaminated Drinking Water in California's San Joaquin Valley*, Environmental Health Perspectives (June 2011).

loading apply equally to all residents within the region reliant on groundwater supplies for drinking water.[177]

In their letter commenting on our October 1, 2024, draft order, petitioners (and others) point to two studies published after the 2013 Dairy General WDRs were adopted that show that groundwater contamination disproportionately affects Latino-serving community water systems, including both disadvantaged and non-disadvantaged communities, and that Latino populations make up a significantly higher share of residents served by out-of-compliance water systems, particularly with respect to nitrate violations.[178] Based on that data, petitioners assert that the disparities of nitrate contamination are ongoing and not merely historical. Petitioners further assert that empirical data in the studies support the conclusion that the 2013 Dairy General WDRs, by failing to focus more extensively on curtailing nitrogen loading from dairies' land application practices and instead focusing on discharges from manure retention ponds, which this order explains is not the predominant source of nitrogen loading to groundwater, allowed for the continued groundwater degradation to occur which only served to perpetuate the disparate impact of nitrate contamination on Latino communities in the San Joaquin Valley. Petitioners add that insofar as this order fails to timely control the same causes of nitrate contamination, it also violates the anti-discrimination statute.

The State Water Board acknowledges the seriousness of the studies cited and does not dispute that Latino-serving community water systems experience disproportionate impacts from groundwater contamination. The findings, however, describe existing and ongoing water quality conditions and do not demonstrate that the 2013 Dairy General WDRs are discriminatory. At their core, waste discharge requirements are prospective regulatory tools that establish enforceable requirements

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[177] This order's conclusions concerning the 2013 Dairy General WDRs' shortcomings do not affect the analysis of whether the 2013 Dairy General WDRs effectuate a disproportionate, adverse impact on a protected class.

[178] Camile Pannu, *et al*., *The Struggle for Water Justice in California's San Joaquin Valley: A Focus on Disadvantaged Unincorporated Communities*, UC Davis Center for Regional Change (Feb. 2018) p. 31; Sarah Acquah, Mara Allaire, *Disparities in Drinking Water Quality: Evidence from California*, Water Policy, vol. 25, no. 2 (Feb. 3, 2023) p. 82 (a copy of these studies are in the administrative record for this proceeding).

and conditions on ongoing or future discharges. Even though more recent information subsequent to the issuance of the 2013 Dairy General WDRs shows that land application is the overwhelming contributor to nitrogen loading, that merely reflects that our understanding of the relative contributions of nitrogen loading continues to evolve as we obtain more data. It does not show the unequal treatment of protected classes of people. Neither does the time schedule endorsed by this order, the "as short as practicable" standard (see discussion at Section III.A.2), by virtue of it balancing technical and practical considerations for timely compliance. Our Nonpoint Source Policy recognizes that because nonpoint source pollution from historical land use practices is tied to complicated economic and political factors, implementation programs will take a significant amount of time to achieve their objectives.[179] The presence of the disparities petitioners describe certainly underscores the need for regulatory action to proceed as a priority, along with timely coordination with other nonregulatory Water Board programs, discussed below. As we explained at the outset of this order, we are very sympathetic to the facts asserted by petitioners. The State Water Board recognizes that its mission to preserve, enhance, and restore the quality of water resources and drinking water is strengthened through a meaningful commitment to racial equity and environmental justice.[180] In developing the regulatory framework, the State Water Board engaged in significant outreach to environmental justice communities and tribes (see Section III.I). Hearing and considering their concerns regarding adverse nitrate impacts to groundwater have helped to inform and strengthen the requirements of this order.

This order remands the 2013 Dairy General WDRs to the Central Valley Water Board and directs it to build on the water quality protections in the 2013 Dairy General WDRs by implementing this order's new regulatory framework to ensure dairies cease causing or contributing to concentrations of nitrate in groundwater that exceed safe drinking water levels over time and, in the interim, provide replacement drinking water to

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[179] Nonpoint Source Policy, p. 16.

[180] In furtherance of that recognition, the State Water Board adopted its racial equity resolution on November 16, 2021 (Resolution No. 2021-0050), and the Central Valley Water Board subsequently adopted a similar resolution in 2022 (Resolution No. R5-2022-0067). The resolutions express the Water Boards' commitment to racial equity, inclusion, and looking through a racial equity lens in their decisionmaking.

those reliant on groundwater with nitrate levels that exceed the nitrate water quality objective (discussed at Section III.C). These water quality protections will have the effect of reducing and correcting nitrate impacts to groundwater.

In coordination with our oversight and regulatory roles, we remain focused on the impacts to disadvantaged communities reliant on groundwater supplies for drinking water from legacy contamination and are taking substantial steps through administration of the Safe and Affordable Drinking Water Fund and other programs to address the challenges faced by communities without access to safe drinking water.

For example, the Safe and Affordable Funding for Equity and Resilience Program (SAFER) is informed by the Final Policy for Developing the Fund Expenditure Plan for the Safe and Affordable Drinking Water Fund (often referred to as the Safe and Affordable Drinking Water Fund's Policy) and the Annual Fund Expenditure Plans.[181] The SAFER Program is designed to provide Californians who currently lack access to safe drinking water receive safe and affordable drinking water as quickly as possible, through providing assistance with interim drinking water supplies, emergency repairs, technical assistance, administrators, planning, operations and maintenance and construction projects via various funding sources.[182]

III. THE NEW REGULATORY FRAMEWORK FOR NITROGEN DISCHARGES

We now turn to the new regulatory framework for nitrogen discharges that we are establishing for the Central Valley Water Board’s development of the revised dairy general waste discharge requirements on remand. The regulatory framework is intended to complement, not supplant, other provisions of the revised dairy general waste discharge requirements. The regulatory framework applies to all dairies in the

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[181] The Safe and Affordable Drinking Water Fund's Policy and archived annual Fund Expenditure Plans are available at: <https://www.waterboards.ca.gov/water_issues/programs/grants_loans/sustainable_water_solutions/safer.html> (as of Aug. 22, 2026).

[182] The State Water Board’s SAFER Dashboard has data from the 2023 Drinking Water Needs Assessment, which is available at: <http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html> (as of Aug. 22, 2026).

Central Valley region for which the Central Valley Water Board issues waste discharge requirements, except as otherwise specified in this order: the regulatory framework is intended to extend beyond the dairies that are formally enrolled in the 2013 Dairy General WDRs—to include all dairies that operate in the Central Valley region, now and in the future.

The ultimate objective of the entire regulatory framework is for dairies to achieve a performance standard of ceasing to cause or contribute to concentrations of nitrate in groundwater that exceed the nitrate water quality objective of 10 mg/L. For the remainder of this order, we will refer to this performance standard as the "Nitrogen Discharge Limit." The Nitrogen Discharge Limit is very similar to the 2013 Dairy General WDRs' Groundwater Limitation insofar as both are qualitative values that express a goal: protecting groundwater quality. The main difference is that it applies only to nitrogen. It also applies even where a dairy is just one of multiple sources of nitrate in groundwater such that it may be only *contributing* to an exceedance.[183] The Nitrogen Discharge Limit applies to all dairy manure management practices, including but not limited to discharges associated with land application, manure retention ponds, and production areas, as well as other discharges of nitrogen from a dairies' operations, including the use of other nitrogen-containing fertilizers. The Nitrogen Discharge Limit is:

> Discharges of nitrogen associated with any aspect of a dairy's operations shall cease causing or contributing to concentrations of nitrate in groundwater that exceed a water quality objective or otherwise unreasonably affect beneficial uses of groundwater in accordance with the time schedule contained herein (or otherwise approved by the Regional Water Quality Control Board at a noticed public meeting).[184]

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[183] The Nitrogen Discharge Limit will be achieved through the land application rate formula (discussed in Section III.A.1) from which slightly different land application rates may be derived due to site-specific conditions such as crop type, soil moisture, and manure nitrogen content, or alternative enforceable final numeric land application rates that directly correlate to the Nitrogen Discharge Limit.

[184] In their letter commenting on our October 1, 2024, draft order, Dairy Cares cites to page 9 of the 2013 Dairy WDRs, contending the Nitrogen Discharge Limit is unnecessary, insofar as it provides that the dairy discharges must not "cause or contribute" to the groundwater exceeding water quality objectives, because the cause or contribute standard is in the 2013 Dairy General WDRs' Groundwater Limitation. Dairy

As described in detail in the Sections that follow, the regulatory framework for nitrogen discharges consists of the Nitrogen Discharge Limit plus nine separate general components. There are four components related to land application of dairy manure, four components related to manure retention ponds, and one component related to the provision of alternative water supplies. The Central Valley Water Board must incorporate the Nitrogen Discharge Limit in its revised dairy general waste discharge requirements and include specific implementation requirements that correspond to each of the components in either Water Code section 13267 Orders (13267 Order) or the revised general dairy waste discharge requirements, as we discuss below. Collectively, the specific implementation requirements must be designed to result in dairy operators complying with the Nitrogen Discharge Limit by the conclusion of a time schedule.[185]

To provide clarity on implementation, our order specifies how four components must be implemented by the Central Valley Water Board, while allowing it some discretion in implementing the remaining required components. For the Nitrogen Discharge Limit, the whole-farm nitrogen accounting component, and the alternative water supply component, we specify how they are to be implemented and incorporated into the revised dairy general waste discharge requirements. The specified implementation requirements for the component for manure retention ponds that may have continuity to groundwater are more appropriately incorporated in 13267 Orders issued to individual dairies rather than the revised dairy general waste discharge requirements. For the remaining land application components and manure retention pond components, the Central Valley Water Board has some discretion to select the

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Cares is mistaken. As we explain in Section I.D, the Groundwater Limitation only includes the mandate to not *cause* the underlying groundwater to exceed water quality objectives and omits reference to contributing to an exceedance. The passage cited in the 2013 Dairy General WDRs, which does contain the cause and contribute language, purports to summarize what that order requires (which is incorrect) and it is limited to land application and does not also apply to all dairy discharges to groundwater. (*Compare* 2013 Dairy General WDRs, p. 23, § F.1 (the Groundwater Limitation), *with id*., at p.9, item 28.b (a summary of land application requirements).

[185] Due to the relatively low nitrogen loading from production areas, although appropriate requirements must be developed to implement the Nitrogen Discharge Limit, we leave their development and implementation to the sound discretion of the Central Valley Water Board.

specific implementation requirements. As we explain below, however, we have developed, or in some cases will develop, proposed implementation requirements for the Central Valley Water Board's consideration for most of the land application components and all of the remaining manure retention pond components.

We direct the Central Valley Water Board to evaluate our proposed implementation requirements along with a reasonable range of alternative implementation requirements, all of which must be designed to achieve compliance with the Nitrogen Discharge Limit, except where we identify the proposed implementation requirement as an interim requirement, in which case the alternative implementation requirement must be designed to achieve generally the same result as our proposed implementation requirement. While we direct the Central Valley Water Board to treat our proposed implementation requirements as the preferred options for the purposes of evaluation, the Central Valley Water Board has the discretion to select alternative implementation requirements tailored to each of the components if it finds that the alternative final implementation requirements will result in dairy discharges achieving compliance with the Nitrogen Discharge Limit within the revised dairy general waste discharge requirement's time schedule, discussed below at Section III.A.2, and that the alternative interim implementation requirements will achieve generally the same result as our proposed implementation requirements.

We recognize that it necessarily will take time to develop the entire regulatory framework and adopt the revised dairy general waste discharge requirements. In response to our October 1, 2024, draft order, we received comments from a range of interested parties expressing concern that requiring the development of the entire regulatory framework prior to the Central Valley Water Board issuing its revised dairy general waste discharge requirements could delay the adoption of any revised general dairy waste discharge requirements by seven years or more. Commenters suggested that program components be worked on concurrently where possible to accelerate the Central Valley Water Board's adoption of the revised dairy general dairy waste discharge requirements. These concerns are well taken. In response, this order sets forth a phased approach for the Central Valley Water Board to implement the regulatory framework, as described in Section III.A.6, which includes its adoption of a single set of

revised general dairy waste discharge requirements. To ensure steady progress, we establish two milestones for the Central Valley Water Board: development of the draft general waste discharge requirements (and its companion draft environmental analysis) within three years, and adoption of the revised general dairy waste discharge requirements within five years. As described in Section IV, the Central Valley Water Board must also report every six months on its progress toward meeting these (and other specified) milestones, which are summarized in Section III.J.

A. Land Application

Naturally, we are focused principally on the land application components of the regulatory framework because, as discussed previously, land application of manure to dairy cropland[186] is the overwhelming source of dairy manure discharges to groundwater in the Central Valley. The CVDRMP's SRMR supports the conclusion that many dairies have been significantly over-applying manure-nitrogen to crop fields.[187] Results of recent monitoring of dairies in the Central Valley indicate that the average concentration of nitrate in shallow groundwater beneath dairy operations was 48 mg/L, with a median concentration of 35 mg/L.[188] Most monitoring well sampling results in the vicinity of dairies show nitrate in excess of the nitrate water quality objective of 10 mg/L.[189] Given that the natural background concentration of nitrate is in the range of 1 to 2 mg/L,[190] the frequently elevated concentrations of nitrate in the immediate vicinity of dairies is a very strong indicator that historic and current dairy manure management practices have been and are continuing to be a major contributor to substantially elevated nitrate concentrations in underlying groundwater.

When properly managed, manure application provides important benefits for dairies, including reducing the need to apply synthetic fertilizers and promoting sustainable dairy practices. Traditional (non-dairy-related) growers can similarly benefit

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[186] For the purposes of the regulatory framework, we refer to all land application areas that are owned or operated by a dairy or by an entity that is affiliated with a dairy owner or operator as "dairy cropland."
[187] See CVDRMP Summary Representative Monitoring Report, p. 10, § 1.5.1.1.
[188] *Id*., p. 6, § 1.4.1.
[189] *Ibid.*
[190] *Harter, Final Report, supra*, p. 63.

from properly managed manure application to their crops. Applying manure or composted manure to croplands can increase soil water holding capacity, add beneficial micro-organisms to improve soil health, improve soil tilth, and help with carbon sequestration. Composting manure reduces the volume and weight of the material, which decreases the cost of transportation, and reduces pathogens. Therefore, composting improves the manure's suitability for use on many crops grown by traditional growers, which helps to support the development of markets for manure products for traditional growers. Composting manure is also a strategy for reducing greenhouse gas emissions. We recognize these benefits and encourage such practices.[191]

Yet we must also ensure that manure applied at dairies is done in a way that protects water quality. In many respects, a dairy's application of dairy manure to its dairy cropland is similar to a traditional grower's application of fertilizer to its cropland for the business enterprise of growing crops that we discussed in Order WQ 2018-0002.[192] The application of dairy manure to dairy cropland inarguably helps the dairy grow the crops that feed the dairy herd, thereby supporting the dairy's operations. In other respects, however, a dairy's application of dairy manure to dairy cropland differs materially from a traditional grower's application of the fertilizers that it must purchase for its business operations. The principal business enterprise of dairies is the production of milk, cheese, and related commodities, and large amounts of manure are generated every day as a byproduct of those operations. Therefore, applying manure to dairy cropland not only serves the purpose of growing crops to feed the dairy herd, but also of helping to address the large amounts of manure produced at dairies. Because there are currently very limited opportunities for dairies to sell or otherwise dispose of the manure that they generate, however, many dairies have a strong economic incentive to over-

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[191] We note that our sister agency, the California Department of Resources Recycling and Recovery (CalRecycle), has adopted regulations that apply to the land application of compostable materials. (See Guidance: Land Application of Compostable Materials and/or Digestate at <https://www2.calrecycle.ca.gov/Docs/Web/121929> (as of Aug. 22, 2026).) Nothing in this order is intended to interfere with CalRecycle's authority in this regard.

[192] State Water Board Order WQ 2018-0002, p. 2.

apply the dairy manure that they have generated to their available dairy cropland. As a result, unlike with traditional growers, the practice of land application for dairies cannot currently be characterized principally as a method of crop fertilization with incidental impacts to groundwater. And the result is now clear: dairy manure has been and continues to be substantially over-applied to dairy cropland, such that the groundwater in the vicinity of dairies in the Central Valley often contains exceedingly high levels of nitrate. The existence of these conditions leads us to the conclusion that regulating dairy operations differently than our currently evolving regulation of traditional agricultural fertilization practices, which are driven more by crop demands than by the need to manage the continuous production of manure, is necessary to protect water quality.[193]

1. Final Numeric Land Application Rates that Correlate Directly to the Nitrogen Discharge Limit

The most important component of the new regulatory framework for nitrogen discharges is enforceable final numeric land application rates that directly correlate to the Nitrogen Discharge Limit. The final application rates will, upon full implementation, ensure that dairies' application of their manure and other nitrogen-containing fertilizers to land does not cause or contribute to an adverse effect on beneficial uses of groundwater due to nitrate concentrations, including drinking water uses. This will ultimately result in a substantial departure from the 2013 Dairy General WDRs' current requirement that land application generally not exceed a nitrogen A/R of 1.4, the value of which does not have a direct relationship with protecting groundwater quality and the implementation of which has been ineffective to date, according to the CVDRMP.[194]

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[193] In its letter commenting on our October 1, 2024, draft order, Rosemont Advocates for a Clean/Safe Environment contends that dairies' discharges of manure to land in excess of agronomic rates renders the discharge unlawful and reclassifies it into a waste disposal site subject to the requirements for waste disposal sites in title 27 of the Code of California Regulations. While we appreciate the point, there is nothing in our regulations that requires that result. This order imposes a regulatory framework that addresses the problem in a different manner.

[194] *Id.*, p. 38, § 2.2.4.

As required by Water Code section 13263, all waste discharge requirements, including the 2013 Dairy General WDRs, are designed to protect the beneficial uses of waters of the state. But different waste discharge requirements use different frameworks for achieving this goal. In order to ensure progress towards achieving a safe drinking water supply is achieved in the future for all Central Valley communities reliant on groundwater as a source of drinking water, the regulatory framework must include enforceable numeric nitrogen land application rates that are directly correlated to compliance with the Nitrogen Discharge Limit. The final numeric land application rates may be phased in over time for existing dairies in accordance with time schedules described in the next section.

For the final numeric land application rates, we have developed a two-part conceptual proposed implementation requirement for deriving dairy-specific multi-year land application rates that are directly correlated to the Nitrogen Discharge Limit. As further described below, our staff will be responsible for developing this proposed implementation requirement for the Central Valley Water Board's evaluation.

The first part of our conceptual proposed implementation requirement is a concentration-based groundwater loading limit that is expressed as the maximum annual pounds of nitrogen that is allowed to leach below the root zone per acre of land application area, divided by the number of acre feet of water that leaches below the root zone per acre of land application area.[195] This groundwater loading limit must be designed to ensure that the concentration of total nitrogen in the discharge beneath the root zone does not exceed 10 mg/L with an additional margin of safety (e.g., 8 mg/L), taking into account any denitrification that occurs naturally below the root zone, averaged across an appropriate time scale and area, not to exceed an individual dairy's

[195] The groundwater loading limit may vary based on site-specific or localized criteria. The term is expressed in the singular to refer to the limit applicable to an individual context.

own land application area.[196,197] The groundwater loading limit assumes that all nitrogen discharged below the root zone will eventually reach groundwater as nitrate if not denitrified. The actual amount of nitrogen that may be discharged below the root zone will vary depending on the volume of water discharged below the root zone (taking into account irrigation, precipitation, evapo-transpiration, groundwater recharge that will dilute the nitrate in the groundwater beneath the dairy and is under the control of the dairy or the applicable management zone—in conjunction with a groundwater sustainability agency or other entity or landowner, etc.) and denitrification that occurs below the root zone. The groundwater loading limit is designed to identify the outer limit of the allowable amount of nitrogen that may reach below the root zone to ensure the dairy's land application complies with the Nitrogen Discharge Limit.

The second part of our conceptual proposed implementation requirement is a multi-year land application rate formula that will be used to determine how much nitrogen can be applied to dairy cropland consistent with the groundwater loading limit to meet the nitrogen discharge limit. To develop the land application rate formula, we will start with the groundwater loading limit and back-calculate a final, multi-year, land application rate formula. The formula will take into account nitrogen applied per acre, crop nitrogen uptake, denitrification in the soil within the root zone, and other available and relevant data and methodologies.[198] The land application rate formula will

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[196] A margin of safety is recommended to ensure compliance despite inherent uncertainties. This threshold proactively accounts for background concentrations and the evaporative concentration effect of plant water uptake, both of which increase the concentrations of remaining nitrate. The groundwater loading limit is used, along with other information, to help ensure that the underlying water quality objective is achieved, but it is not the water quality objective itself.

[197] Some comments on our October 1, 2024, draft order cautioned that averaging nitrogen loading on an "appropriate area and time scale" could allow for high pollution levels in some areas, creating localized areas of nitrate concentrations exceeding 10 mg/L, referred to as "hot spots," a threat to human health. We are also concerned about potential occurrences of localized higher nitrate concentrations. Although the groundwater loading limit and final land application rates will be based in part on modeling so some amount of averaging will need to occur, the modeling must include measures to identify and characterize higher-risk zones separately from the averaged area to ensure hot spots are not created.

[198] Existing technical and modeling approaches, including the Groundwater Protection framework being developed in accordance with our *Eastern San Joaquin River*

determine how much manure and other nitrogen-containing fertilizers a dairy operator can land apply in a given year consistent with a multi-year land application rate. At the conclusion of a time schedule determined by the Central Valley Water Board, dairies would be required to comply with the final multi-year land application rates derived from the final land application rate formula.

As stated, our staff will take on the responsibility of developing both the groundwater loading limit and the land application rate formula. We will prioritize this work with a milestone for completing it within no more than four years from the date of this order. While this work will be led by State Water Board staff, who will serve as the project managers for this effort, the technical work will be carried out through meaningful collaboration with the Central Valley Water Board, along with technical coordination with the CVDRMP and augmented, as appropriate, by contracted expert consultants and academic advisors. The groundwater loading limit and the land application rate formula will be a data-driven product of the application of sound scientific principles, rather than the result of a panel of practitioners, but State Water Board staff will work collaboratively with stakeholder groups during their development to ensure their development is transparent and informed by meaningful stakeholder engagement. This approach will allow interested parties to understand the technical components and provide input as appropriate. Although the external peer review requirements of Health and Safety Code section 57004[199] do not apply to water quality orders or waste discharge requirements, we intend to use a similar external peer review approach for both the groundwater loading limit and the land application rate formula to ensure that this recommended component of our regulatory framework undergoes an independent, scientific review to ensure transparency and technical defensibility.

Watershed Order, WQ Order 2018-0002, and other approaches developed for our ILRP, should be evaluated to determine whether they are appropriate to assist development of the groundwater loading limit and land application formula. Our ILRP does not currently require enforceable final numeric land application rates that directly correlate to the Nitrogen Discharge Limit, however, so any existing ILRP approaches would need to be revised for this use.

[199] See Health & Saf. Code, § 57004 (requiring any California Environmental Protection Agency board, department, and office to submit for external scientific peer review the "scientific basis" and "scientific portions" of proposed rules).

Upon our finalization of our two-part conceptual implementation requirement, we will forward it to the Central Valley Water Board for its evaluation as the preferred option to satisfy the final numeric land application rates component of the regulatory framework when it considers adoption of its revised dairy general waste discharge requirements (see Section III.A.6.b).

2. Time Schedule for Existing Dairies' Compliance with Final Numeric Land Application Rates

It will undoubtedly take time for existing dairies, which we define below in Section III.A.2.a, to come into compliance with the final numeric land application rates described above. Therefore, the next component of the regulatory framework is a time schedule for existing dairies to come into compliance with those final application rates. The Central Valley Water Board must establish one or more final time schedules (e.g., for different groupings of existing dairies based on size, manure management practices, or other characteristics that the Central Valley Water Board determines are relevant to the amount of time needed to achieve compliance) for existing dairies to achieve compliance with the final land application rates. The final time schedule shall reflect a realistic assessment of the shortest practicable time required to achieve compliance and the considerations we set forth below.

We recognize that, given the current realities as recounted by the CVDRMP's SRMR,[200] it will necessarily take significant time for the dairy industry and other relevant collaborators to develop the treatment and technological capacity and associated markets necessary for exporting manure-nitrogen off dairies, and denitrification or other manure treatment technologies that reduce the amount of manure-based nitrogen, in order for existing dairies to progressively limit the amount of manure land applied to dairy cropland—particularly at a scale sufficient for industry-wide compliance with the Nitrogen Discharge Limit.[201]

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[200] See, e.g., CVDRMP Summary Representative Monitoring Report, pp. 26-27, § 1.6.4.

[201] See *id.*, pp. 65-73, §§ 3.2 to 3.2.4 (evaluating different management practices to avoid subsurface loading of nitrogen, including exporting strategies of solid manure,

The CVDRMP's SRMR concluded that exporting untreated liquid and solid manure may be cost-prohibitive for many existing dairies and potentially impracticable in terms of the current limited market demand for these manure products relative to the amount generated at dairies industry-wide.[202] Manure treatment technologies can range from relatively high-technology processes such as anaerobic digestion to produce energy to relatively low-technology management practices such as composting. The resulting material from composting can be more easily transported off the dairy and can be used for a wider variety of purposes than raw manure due to the weight and volume reduction in addition to the reduction in pathogens, while the digestate resulting from anaerobic digestion results in a reduction of pathogens and other benefits, but neither technology is currently being employed at a sufficient scale. Additional treatment technologies exist, such as using vermifiltration or vermiculture composting to denitrify liquid manure, but may not be cost-effective unless a market for the resulting product is developed.[203] We strongly support the efforts by CDFA, the dairy industry, and their partners to conduct research to help facilitate the safe export and reuse of greater amounts of dairy manure,[204] and encourage the dairy industry to assist CDFA in obtaining a stable source of funding to continue these necessary efforts. We also pledge to do our part to actively support efforts to develop sustainable markets for dairy manure, consistent with our mandates to protect water quality and human health. In particular, we fully support CDFA's important efforts to ensure the safety of California's food supply. To that end, we will work with CDFA and assist the Central Valley Water Board in developing requirements to include in its revised dairy general waste discharge requirements that obligate dairies to manage their manure in compliance with all

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diversion of liquid manure to solid storage and export, and expanding liquid manure infrastructure for distribution across all of a dairy's cropland).

[202] *Id*., pp. 65-70, §§ 3.2.1 to 3.2.2 (providing cost estimates to export solid and liquid manure).

[203] *Id*., pp. 12-13, § 1.5.2.

[204] See, e.g., Kaffka et al., *Manure Nutrient Recovery, Removal, and Reuse on California Dairies*, October 15, 2022 (updated May 2025) at <https://www.cdfa.ca.gov/oefi/research/docs/CBC_Manure_Nutrient_Report.pdf> (as of Aug. 22, 2026).

relevant food safety laws and guidance.[205] In addition to CDFA and the Central Valley Water Board, other agencies we will seek to coordinate with on these efforts will include the California Air Resources Board, CalRecycle, the United States Department of Agriculture, Natural Resources Conservation Service, and other relevant agencies.

The Nonpoint Source Policy highlights the challenges of reversing decades of practices that cause nonpoint source pollution and acknowledges the need for time:

> Current land use management practices that have resulted in NPS [nonpoint source] pollution have a long and complicated physical, economic and political history. In addition to the need for resources, forging a new history of pollution control will take time and commitment, as well as a willingness to examine the use of practices that have resulted in current [nonpoint source] pollution discharges and the barriers to change. Therefore, it is expected that it will take a significant amount of time for the [regional water boards] to approve or endorse [nonpoint source] control implementation programs throughout their regions, and even longer for those programs to achieve their objectives.[206]

Some existing dairy operators have recognized the need to reduce manure-nitrogen loading and are employing new strategies to do so.[207] The CVDRMP's SRMR recognizes that dairy operators must stand ready to engage with all willing partners in government and academia to develop strategies to meet water quality requirements. We are encouraged by this recognition and commitment.

Bearing in mind the above considerations, the Central Valley Water Board is directed to establish the deadline for existing dairies to comply with the final numeric land application rates consistent with the terms for compliance within the "Exceptions Policy" of CV-SALTS. That is, the Central Valley Water Board shall require each existing dairy, or each grouping of existing dairies, to comply "within a term as short as

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[205] See, e.g., Subpart F of the federal Food Safety Modernization Act, Produce Safety Rule at <https://www.regulations.gov/document/FDA-2011-N-0921-18558> (as of Aug. 22, 2026).

[206] Nonpoint Source Policy, p. 16.

[207] See CVDRMP Summary Representative Monitoring Report, § 3.22, pp. 68-70 (reporting that some dairy operators recognize there is excess nitrogen in liquid manure and are diverting nitrogen from liquid to solid storage for export).

practicable for each discharger or category of dischargers participating in the management zone but in no case longer than 35 years."[208, 209]

In their letter commenting on our October 1, 2024, draft order, petitioners (and others) noted that it does not expressly state when the time schedule under CV-SALTS would commence. The CV-SALTS' provisions do not expressly identify when the time schedule would commence for any particular discharger or category of dischargers. CV-SALTS is a planning-level regulatory framework under which a discharger may seek an "exception to discharge requirements from the implementation of the water quality objective[] for nitrate," and the Central Valley Water Board may consider authorizing the exception and granting a time schedule to meet the nitrate water quality objective for a term that is as short as practicable, up to 35 years.[210] Under the framework of CV-SALTS, a management zone may request exceptions and time schedules to meet the nitrate water quality objective for its participants, and must include all the requisite information in the management zone implementation plan necessary for the time schedule to be considered.[211] CV-SALTS also requires the Central Valley Water Board to require status reports and conduct a public hearing to review the approved time schedules every five years to confirm that each schedule remains as short as practicable.[212]

As previously noted, on June 3, 2026, the Central Valley Water Board issued an order that approved its first priority 1 management zone implementation plan, the Modesto Management Zone Implementation Plan, authorized exceptions for the participants, and amended relevant waste discharge requirements, including the 2013 Dairy General WDRs, to incorporate a 35-year time schedule for the 54 dairies that are

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[208] CV-SALTS, *supra*, ch. 4, Implementation, *Exceptions Policy for Salinity, Nitrate, and/or Boron*, items (2) and (4), pp. 85-86.

[209] This restriction is consistent with the Nonpoint Source Policy's requirement that all nonpoint source control implementation programs include a specific time schedule no longer than that which is reasonably necessary to achieve the program's water quality objectives. (Nonpoint Source Policy, p. 13, Key Element 3 and succeeding commentary.)

[210] CV-SALTS, *supra*, ch. 4, Implementation, *Exceptions Policy for Salinity, Nitrate, and/or Boron*, items (1) and (2), p. 85.

[211] *Id*., *Management Zone Implementation Plan (Path B)*, item (xii), at p. 55.

[212] *Id*., item (5), p. 86.

participating in the Modesto Management Zone (and time schedules of varying durations for the non-dairy participants in the Modesto Management Zone), as proposed by the Modesto Management Zone Implementation Plan.[213] In so doing, the Central Valley Water Board explained that the time schedules were only initial schedules, and that it was required to review the appropriateness of the schedules at least once every five years. The Central Valley Water Board further explained that it "anticipates that, as the [management zone implementation plan] is implemented, the information gained and lessons learned from those activities will provide increased clarity on appropriateness of dischargers' exception terms."[214] The Central Valley Water Board will continue to consider approving management zone implementation plans and time schedules for the remaining priority 1 and the priority 2 groundwater basins. Under CV-SALTS, the time schedules for the participants in different management zones will commence at different times, upon the issuance or amendment of the applicable waste discharge requirements.

To be clear, under CV-SALTS, time schedules to comply with the final numeric land application rates that will be established by the Central Valley Water Board—for dairies participating in management zones (Path B) and dairies proceeding under the individualized permitting approach (Path A)—must be as short as practicable, with a maximum length of 35 years, commencing with the date that the Central Valley Water Board authorizes the exception and approves the time schedule. The Central Valley Water Board may amend the 2013 Dairy General WDRs when it approves a management zone implementation plan as it did with the Modesto Management Zone Implementation Plan, or when it adopts the revised dairy general waste discharge requirements, whichever occurs first, for any dairy or group of dairies. (This Order discusses the scope and the anticipated timing of the revised dairy general waste discharge requirements at Section III.A.6.b.)

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[213] Central Valley Water Board Order R5-2026-0032, at <https://waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2026-0032_wdrs.pdf> (as of Aug. 22, 2026).
[214] *Id.*, finding 15, pp. 6-7.

The Central Valley Water Board will establish final deadlines for existing dairies in management zones to achieve compliance with the final numeric land application rates when it establishes the final numeric land application rates in the revised dairy general waste discharge requirements, Until then, we support the Central Valley Water Board's continuing approval of MZIPs that comply with CV-SALTS, including authorizing exceptions to discharge requirements from the implementation of the water quality objective for nitrate and approving corresponding time schedules for existing dairies in accordance with CV-SALTS prior to its adoption of the revised dairy general waste discharge requirements.

As stated above, CV-SALTS requires that all dischargers with authorized exceptions must prepare status reports every five years for the Central Valley Water Board's review of the schedules in a public hearing to determine whether the term is still as short as practicable for each discharger or category of dischargers.[215] The first five-year review for all dairies that have received exceptions will help to inform the Central Valley Water Board's establishment of the final deadlines for existing dairies to achieve compliance with the final numeric land application rates when it adopts its revised dairy general waste discharge requirements. Subsequent five-year reviews and ten-year reviews[216] will inform the Central Valley Water Board whether the final deadlines in the revised dairy general waste discharge requirements are still as short as practicable or warrant revisions to make them shorter.

Principles of fairness and the need for the entire Central Valley dairy industry to work together to develop technologies and a manure export market, strongly suggest that, when it adopts its revised dairy general waste discharge requirements and any subsequent revisions, the Central Valley Water Board should establish a single final deadline for compliance with the final numeric land application rates that applies equally

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[215] CV-SALTS, *supra*, item (5), p. 86.

[216] CV-SALTS also provides that "the Central Valley Water Board will require those discharger(s) with authorized exceptions terms greater than ten years to prepare and submit a report every ten years that reassesses Best Management Practices (BMPs) and surveys available treatment technologies to determine if feasible, practicable and reasonable compliance options have become available." CV-SALTS, *supra*, item (9), p. 87.

to the grouping of existing dairies that need the most time to comply, and additional shorter deadlines for groupings of existing dairies that can comply sooner, regardless of the date that any individual dairy's time schedule commences under CV-SALTS. If the Central Valley Water Board were to do so, the maximum deadline for all dairies that need the most time to comply would be no later than the date that is 35 years from the date that the Central Valley Water Board authorized the exception and approved the time schedule for the dairies in the Modesto Management Zone, or June 3, 2061.

For existing dairies in the Central Valley region that fall under the individual permitting approach (Path A) of CV-SALTS (i.e., the dairy decides to comply as an individual or a management zone is not available), CV-SALTS provides that the Central Valley Water Board may provide a limited time schedule for compliance with the nitrate water quality objective.[217] We expect that the final compliance deadlines for any such existing dairies will be no later than the final compliance deadlines for similar existing dairies that are participating in a management zone.

As stated, the discussion above applies only to existing dairies. The same practical necessity for a time schedule for compliance with the land application rates does not apply to new dairies, as defined in Section III.A.2.a. All new dairies must be designed to immediately comply with the most stringent land application rates that have been established by the Central Valley Water Board in waste discharge requirements as of the date that the new dairy files its complete ROWD.[218] Prior to the Central Valley

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[217] *Id*., items (1), (2), and (4), pp. 85-86.

[218] Contrary to some commenters' suggestions, new and expanded dairies in a CV-SALTS management zone are not necessarily entitled to take advantage of the same time schedule for compliance as existing dairies in that management zone. To the contrary, CV-SALTS provides that "[d]ischarges of nitrate must cease causing or contributing to exceedances of water quality objectives in the receiving water within a term that is as short as practicable for each discharger or category of dischargers participating in a Management Zone but in no case longer than 35 years." (*Id*., item (2), p. 85.) New and expanded dairies can avoid causing or contributing to exceedances of the nitrate water quality objective by ensuring that they have sufficient land application areas, treatment capacity, or export ability to comply with the Nitrogen Discharge Limit before they commence operations, so there is no need for the Central Valley Water Board to allow them to further exacerbate the nitrate groundwater contamination. CV-SALTS does allow proposed new and expanded dischargers of nitrogen to join a current or future management zone and allows a management zone to request an exception to

Water Board's adoption of the revised dairy general waste discharge requirements, the immediately applicable land application rate for new dairies is the existing 1.4 A/R land application rate in the 2013 Dairy General WDRs and other applicable WDRs. Upon the Central Valley Water Board's adoption of the revised dairy general waste discharge requirements, the immediately applicable land application rate for new dairies will be the final numeric land application rates described in Section III.A.1. The distinction between an existing dairy and a new dairy can be complicated, so in the following sections we define some key terms, explain the basic principles and provide some examples regarding the varying timing for compliance with the land application requirements that must be implemented by the Central Valley Water Board.

a. Existing, Expanded, and New Dairies

When this order refers to "existing dairies" in the context of the time schedules to comply with the interim and final land application requirements that the Central Valley Water Board will include in its revised general dairy waste discharge requirements,[219] it includes all dairies that (a) have already commenced operating as of the date of this

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meeting a nitrate water quality objective that applies to all permitted dischargers participating in the management zone. (*Id*., pp. 48, 55).

Importantly, however, one of the revisions that we directed the Central Valley Water Board to make to CV-SALTS was to specify that the management zone implementation plans "must include proposals for enforceable and quantifiable interim deadlines that focus on reducing nitrate in *ongoing discharges* and a proposed final compliance date for *ongoing discharges* of nitrate to cease causing or contributing to exceedances of the applicable water quality objective in the receiving water … ." (See *supra*, fn. 99 and accompanying text.) And CV-SALTS implements that direction. (CV-SALTS, *supra*, p. 53.) By the time that the Central Valley Water Board adopts the revised dairy general waste discharge requirements, it should have already approved all of the management zone implementation plans, including the management zones' requests for exceptions. As a result, any proposed new or expanded dairies after the adoption of the revised dairy general waste discharge requirements will not qualify as "ongoing discharges." Finally, given the significant contributions of dairy manure to groundwater nitrate pollution that is affecting communities in the Central Valley, we find that it is not appropriate to allow new or expanded dairies after the Central Valley Water Board's adoption of the revised general waste discharge requirements to perpetuate, or even exacerbate, that pollution. Discharges to waters of the state are a privilege, not a right. (Wat. Code, § 13263, subd. (g).)

[219] This definition of "existing dairies" also applies in the context of manure ponds. (See fns. 254 and 263.)

order and either (b) are already formally enrolled in individual waste discharge requirements, either of the general waste discharge requirements for dairies that utilize digesters or co-digesters, or the 2013 Dairy General WDRs[220] for their current herd size[221] as of the date of this order or (c) become newly enrolled in the 2013 Dairy General WDRs by the deadline, as described herein, for their current herd size. To

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[220] We note that formal enrollment under the 2013 Dairy General WDRs was, by its terms, limited to dairies that were operating as of 2005, that had submitted a complete ROWD in response to the Central Valley Water Board's 2005 Report of Waste Discharge Request Letter, and had not expanded since 2005. We have been informed, however, that starting sometime after 2013, the Central Valley Water Board staff informally instructed some dairies that proposed to commence operations or expand their ongoing operations to submit a complete ROWD prior to commencing or expanding their operations, as applicable, and to comply with the substance of the 2013 Dairy General WDRs despite not being formally enrolled. We understand that the Central Valley Water Board took this approach largely because it did not have the staffing resources to act as the CEQA lead agency and issue individual waste discharge requirements for such dairies, and more recently, because the Central Valley Water Board has been awaiting our issuance of this order.

This approach may be necessary in the very short term in rare cases for some dischargers, and is even contemplated by Water Code section 13264, subdivision (a)(2), for discharges that do not "create or threaten to create a condition of pollution or nuisance." We cannot, however, condone the continuation of this approach, in part because it leaves the regional water boards without the clear ability to enforce their waste discharge requirements.

We do not know the number of dairies that have either commenced operations or expanded since 2005 because there is no data field in the California Integrated Water Quality System (CIWQS) database that separately tracks such new or expanded dairies that are only informally enrolled in the 2013 Dairy General WDRs. We direct the Central Valley Water Board staff to, within 180 days of the date of this order, identify all dairies, and their current herd sizes, that are currently operating and distinguish between those that are already formally enrolled under the 2013 Dairy General WDRs for their current herd size, those that become newly enrolled under the amended 2013 Dairy General WDRs for their current herd size, and those that are still not enrolled under the 2013 Dairy General WDRs for their current herd size, in CIWQS.

We also note that all existing dairies are required to pay annual waste discharge fees regardless of whether they have been formally enrolled in waste discharge requirements. (Wat. Code § 13260(d)(1)(A).) Therefore, we also direct Central Valley Water Board staff to promptly provide our staff with a complete list of all dairies in the Central Valley region so that we can ensure that the dairy program costs are shared equitably by all dairies.

[221] A dairy's "herd size" refers to the number of mature dairy cows at the dairy, but dairies are also required to report the total number and type of all cattle generating manure at the dairy, e.g., dairy cows, calves, and heifers.

ensure that all dairies that are currently operating but are not formally enrolled in the 2013 Dairy General WDRs for some or all of their current herd size have the ability to enroll in the amended 2013 Dairy General WDRs, we direct the Central Valley Water Board to reopen and amend its 2013 Dairy General WDRs within 150 days of the date of this order for the sole purposes of authorizing enrollments for any dairy that is currently operating as of the date of this order to submit current operational details (including the current herd size as of the date of this order) and enroll under the amended 2013 Dairy WDRs within a deadline of 60 days after the amendment to the 2013 Dairy General WDRs, and to authorize future expansions of these dairies subject to the limitations described below.[222]

The Central Valley Water Board, in coordination with dairy industry groups, must promptly inform all dairies that any dairy with a current herd size not already formally enrolled in the 2013 Dairy General WDRs must submit all of the information required by the Central Valley Water Board, including documentation sufficient to verify the accuracy of their herd size as of the date of this order no later than the deadline. If they do so, the Central Valley Water Board may treat their current herd size as an existing dairy and therefore give them the benefit of up to the full interim and final time

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[222] We are taking this very unusual step due to these unique circumstances. Both the Central Valley Water Board and the dairy industry representatives submitted comments urging us to reset the baseline herd sizes to the herd sizes as they exist on the date of this order for the purpose of defining existing dairies, even though some dairies, or portions of dairies' herds, are not enrolled in any waste discharge requirements. Although it was not raised by either the Central Valley Water Board or the dairy industry, we are taking the additional step of requiring all such dairies to affirmatively enroll their current herd sizes in the 2013 Dairy General WDRs as an appropriate tradeoff to bring such dairies under the full regulatory authority of the Central Valley Water Board to require needed monitoring and reporting and compliance with the provisions of the 2013 Dairy General WDRs. The Central Valley Water Board can do so expeditiously, by amending the 2013 Dairy General WDRs, because the currently operating dairies and their current herd sizes are existing facilities and represent the existing environmental baseline for the purposes of the California Environmental Quality Act (CEQA). In addition, the Central Valley Water Board may rely on CEQA categorical exemptions related to existing facilities and minor alterations of land. The amended 2013 Dairy General WDRs will regulate those existing operations and not authorize new dairies. Later expansions under the 2013 Dairy General WDRs would only be authorized by the Central Valley Water Board if the expansion is accompanied by proof of CEQA compliance.

schedules for the land application requirements for the proportion of the dairy manure generated by their current herd size when it adopts the revised dairy general waste discharge requirements. However, the Central Valley Water Board must make it clear that for any expansions of herd sizes after the date of this order and prior to the Central Valley Water Board's adoption of the revised dairy general waste discharge requirements, the only way to be treated as an existing dairy for the expanded herd size is to obtain coverage under either of the digester or co-digester general waste discharge requirements or the amended 2013 Dairy General WDRs by submitting a complete ROWD that demonstrates immediate compliance with the currently applicable 1.4 A/R land application requirement for the portion of manure that will be generated by the additional cows, accompanied by proof of CEQA compliance for coverage under the 2013 Dairy General WDRs, and wait for the Central Valley Water Board's notice that it has granted coverage prior to expanding the herd size. All other expansions of herd sizes, either before or after the Central Valley Water Board adopts the revised dairy general waste discharge requirements will be treated the same as new dairies.

It is therefore important to note that a single dairy may, in some circumstances, have a fixed number of its dairy herd as of the date of this order that is considered to be an "existing" dairy, while subsequent expansions to that dairy herd will be considered to be the equivalent of a new dairy—even where all of the cows have been combined into a single herd. The consequence is that the proportion of the dairy manure generated by the fixed herd size that is considered to be "existing" will receive the full benefit of the time schedule, but the proportion of the dairy manure generated by the dairy expansion, which is considered "new," will not receive any time schedule for compliance with the final land application rates.[223]

We define "new dairies" in the context of the schedules to comply with the interim and final land application requirements, as any dairy, as well as any expansion of a dairy, that does not meet the definition of an existing dairy. This means that any dairy

[223] For example, if 80 percent of the herd is "existing" and therefore subject to an interim 1.4 A/R ratio, and 20 percent of the herd is "new" and therefore subject to a 1.1 A/R ratio, the total manure generated by the entire herd is subject to a 1.34 A/R ratio ((0.80 x 1.4) + (0.20 x 1.1) = 1.34).

that is currently operating as of the date of this order but fails to enroll in the updated 2013 Dairy General WDRs is considered a new dairy, except where a dairy is already subject to the digester or co-digester order or an individual waste discharge requirements by the date of this order. For existing dairies, this also means that any portion of the herd that constitutes an expansion of the dairy after the updated 2013 Dairy General WDRs will be treated as a new dairy if it does not follow the requirements outlined above.

b. Dairy Consolidations

We understand from dairy industry representatives that consolidations of dairies have been, and are likely to remain, common in the dairy industry in California. A dairy consolidation generally consists of the combination of two or more dairies, which raises questions about whether the Central Valley Water Board should treat dairies that are the result of consolidations as new dairies for the purposes of applying the time schedules for the consolidated dairies to comply with the interim and final land application requirements. Ultimately, there are many potential variations of dairy consolidations, with varying changes to the pre-consolidation dairy manure management practices and groundwater impacts from the original dairies that were consolidated. While we cannot predict all of the variations of dairy consolidations, we set forth here some general principles that the Central Valley Water Board shall use in determining how the time schedules will apply to future dairy consolidations.

First, to the extent that a dairy consolidation does not affect the pre-consolidation dairy manure management practices and resulting groundwater impacts, the Central Valley Water Board should not treat the consolidated dairy as a new dairy as of the date of the consolidation. An example of this type of consolidation is where one dairy purchases a neighboring dairy but continues to operate both dairies as separate dairies with the same herd sizes and dairy manure management practices as before the purchase.

Second, the Central Valley Water Board shall treat any dairy consolidation that would result in greater groundwater impacts in one area, even if lessens the groundwater impacts in another area, as a new dairy in the area with the greater

impacts. An example of this type of consolidation is where one dairy purchases a second dairy and adds the second dairy's herd to the first dairy's herd and sells the second dairy's land application area. This is the functional equivalent of an expansion at the first dairy, so the portion of the dairy manure attributable to the second dairy's herd should be treated like a new dairy as of the date of the consolidation.

Third, the Central Valley Water Board shall treat any dairy consolidation that would result in groundwater impacts in areas that are not already impacted by dairies as a new dairy. An example of this type of consolidation is where one or more operating dairies are closed and their herds are moved to newly developed, more modern and protective dairy facilities in an area where there have not previously been any dairies. Even though the new facilities represent a clear improvement compared to the closed dairies, the consolidation will create new groundwater impacts in an area that was not previously impacted by dairies so the consolidated dairy should be treated like a new dairy as of the date of the consolidation.

3. Interim Numeric Land Application Rates and Interim Time Schedules for Existing Dairies

Every year that dairy discharges cause or contribute to exceedances of the nitrate water quality objective, multiple years are added to the groundwater restoration timeline. It is therefore critical that existing[224] dairy operations start making measurable progress in reducing their land application of nitrogen as soon as possible and continue to make progress as quickly as feasible throughout the time schedule described above, culminating in compliance with the final land application rates to comply with the Nitrogen Discharge Limit. Therefore, the early imposition of progressively more protective enforceable interim numeric land application rates and other enforceable interim milestones and corresponding interim time schedule deadlines is also a very

[224] This order puts all existing dairies on notice that they need to cease causing or contributing to exceedances of the nitrate water quality objective in groundwater. As a result, existing dairies can and should start planning and taking action without waiting for the Central Valley Water Board to issue its revised dairy general waste discharge requirements.

important component of the regulatory framework.[225] To ensure that dairies are on track to meeting each of the interim numeric land application rates and other interim milestones, to the extent that any of the deadlines are four or more years apart, the Central Valley Water Board should also require dairies to report substantial and measurable progress by the midpoint between each interim deadline.

The Central Valley Water Board's 2007 Dairy General WDRs first established the 1.4 A/R land application requirement,[226] and that requirement has remained in effect since then. Some commenters have stated that the 1.4 A/R land application rate may not have reflected an appropriate agronomic rate for some dairies at the time that it was adopted and that many dairies are still not achieving the 1.4 A/R land application rate. Both statements may be true, but we take the opportunity to explain that it is not necessary for the interim land application rates and milestones to be based on agronomic rates or on the average dairy's current land application rates. By the time that the Central Valley Water Board adopts its revised dairy general waste discharge requirements, the 1.4 A/R land application rate will have been in effect for well over two decades. For this reason alone, our strong expectation is that the first interim land application rate in the revised dairy general waste discharge requirements will be either a 1.4 A/R land application rate consistent with the 2007 Dairy General WDRs and the 2013 Dairy General WDRs, or another interim numeric land application rate that is at least as protective of groundwater as the 1.4 A/R land application rate. Otherwise, we generally leave the determination of the specific interim numeric land application rates and other interim milestones and their corresponding interim deadlines to the reasoned

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[225] This direction corresponds to the Nonpoint Source Policy's requirements that a nonpoint source control implementation program include "corresponding quantifiable milestones designed to measure progress toward reaching the specified requirements" and "sufficient feedback mechanisms so that the regional water board, dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different [management practices] or other actions are required." (Nonpoint Source Policy, p. 13, Key Elements 3 & 4.)

[226] 2007 Dairy General WDRs, p. 16, § C.1 (requiring land application of manure be conducted in accordance with a certified Nutrient Management Plan consistent with the technical standards for nutrient management as specified in Attach. C, NMP); *id*., Attach. C, NMP, pp. C-10 – C-11, Technical Standards for Nutrient Management § V.B.2.a.

judgment of the Central Valley Water Board, but we urge all due haste. For example, one milestone could be requiring that all dairies achieve whole-farm nitrogen balance, as generally described by the CVDRMP's SRMR[227] and discussed in Section III.A.4, no later than a deadline specified by the Central Valley Water Board.

The Central Valley Water Board's revised dairy general waste discharge requirements shall include progressively more stringent interim numeric land application requirements coupled with defined time schedules to provide a structure for incremental reduction in existing dairies' application of manure and other nitrogen-containing fertilizers over time. For illustrative purposes only, this could include transitioning from the 2013 Dairy General WDRs' A/R ratio of 1.4 that is currently in effect to 1.35 A/R within three years of issuance of the revised dairy general waste discharge requirements, followed by 1.3 A/R within six years, followed by 1.25 A/R within nine years, etc.

The Central Valley Water Board should also consider imposing interim milestones that reduce land application of dairy manure in other ways, including by taking into account a dairy's ratio of mature dairy cows to land application acres, as a potential alternative to complying with the interim numeric land application rates for some dairies. Also, for illustrative purposes only, this could include transitioning to 1.5 cows per acre within three years of issuance of the revised dairy general waste discharge requirements, followed by 1.4 cows per acre in six years, followed by 1.3 cows per acre in nine years, etc.

As another illustrative example of an interim milestone, the Central Valley Water Board could determine that any dairy that can demonstrate that nitrogen is being applied at a rate of one cow per acre, or that qualifies as a pasture-based dairy, based on criteria defined by the Central Valley Water Board,[228] is exempt from complying with

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[227] CVDRMP Summary Representative Monitoring Report, pp. 10, § 1.5.1.1, pp. 51-51, § 2.4.3. While the whole-farm nitrogen balance approach is a promising tool, the foundational methodologies for calculating N inputs and outputs need to be further developed, so the approach is still just a conceptual framework at this time.

[228] For example, pasture-based dairies could include pasturelands with grass and other forages where the mature dairy cows typically graze during more than ten months of the year and crops, vegetation, and forage growth on the pasturelands are sustained in the normal growing season.

some or all of the other interim land application requirements and, potentially, many of the associated accounting and reporting requirements, until the time to comply with the final land application limits approaches.

In addition to the illustrative examples we identified above, we also received a number of comments on our October 1, 2024, draft order with specific suggestions for interim land application requirements. We encourage those commenters to provide that feedback directly to the Central Valley Water Board in development of their revised dairy general waste discharge requirements and California Environmental Quality Act (CEQA) environmental document.

In addition to interim numeric land application rates and other interim milestones, the Central Valley Water Board should also consider whether other types of interim requirements related to land application are appropriate. As examples, the revised dairy general waste discharge requirements could include automatic educational requirements (in addition to potential enforcement actions) for dairies that are in significant violation of the applicable interim numeric land application rates or other interim milestones, and interim requirements to reduce or phase out the use of synthetic fertilizer products to the extent feasible on dairy cropland that is also being used for land application within a certain number of years.[229]

4. Whole-Farm Nitrogen Accounting

The CVDRMP's SRMR states that evidence from individual dairies' reports suggests that many dairies are not properly accounting for all of the dairy manure that they are generating and that "[l]arge amounts of unaccounted-for nitrogen, combined with imprecision in measurement of applied nitrogen and irrigation water, can result in

[229] The CVDRMP's SRMR recognizes that because some dairies do not have the infrastructure to distribute liquid manure to all their cropland, some dairy cropland receives only synthetic fertilizers. According to their cost estimates across several approaches, the savings in foregoing purchases of synthetic fertilizers may pay for the capital costs to improve the infrastructure to make better use of the manure nitrogen (assuming the dairy has excess liquid manure) within four to six years—while achieving a significant nitrogen loading reduction from the land application of dairy manure. (CVDRMP Summary Representative Monitoring Report, p. 71, § 3.2.3.)

overapplication of nitrogen to crops and reduced [nitrogen use efficiency]."[230] As we explain in Section III.A.5.f, however, we are requiring that the Central Valley Water Board continue to use, and update, the nitrogen applied and removed approach, which utilizes direct measurements of both nitrogen applied and nitrogen removed. In addition, another component of our new regulatory framework is the development of a second nitrogen accounting approach that can also be used to measure compliance with the interim and final numeric land application rates. For this component, we specify that the accounting approach must be based on the CVDRMP's SRMR's whole-farm nitrogen balance concept.[231]

The SRMR includes a series of recommendations which, through coordinated and likely phased implementation efforts, would achieve a "whole-farm nitrogen balance." According to the CVDRMP's SRMR, a whole-farm nitrogen balance approach requires all nitrogen generated at the dairy be accounted for (e.g., applied to land, exported from the farm, denitrified, lost from pond seepage, and lost through volatilization from the manure retention ponds) in addition to other potential nitrogen sources required to calculate the whole-farm nitrogen balance (e.g. synthetic fertilizer). According to the CVDRMP's SRMR, achieving whole-farm balance requires dairies to apply manure nitrogen to crops at "proper" rates, which includes accounting for the differences of nitrogen in liquid and solid manure.[232] A dairy achieves whole-farm nitrogen balance when it applies nitrogen on crops at no more than appropriate agronomic rates. All excess nitrogen must be removed from the dairy (exported) or treated (e.g., denitrified on farm). The CVDRMP's SRMR posits that, upon all dairies

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[230] CVDRMP Summary Representative Monitoring Report, p. 10, § 1.5.1.1; see *infra*, fn. 83.

[231] *Ibid*.

[232] *Id*., p. 27, § 1.6.4. The CVDRMP's Summary Representative Monitoring Report does not explain what "proper" rates are, but it appears from the context that it may be referring generally to agronomic rates. Because agronomic rates are used for efficient crop production, they are not necessarily protective of groundwater quality. We believe that, in many cases, the application of dairy manure at agronomic rates would not comply with the Nitrogen Discharge Limit. We also caution that the Central Valley Water Board would need to establish an enforceable numeric land application rate that must be achieved as an element of the whole-farm nitrogen balance concept if it chooses to use whole-farm nitrogen balance as an interim land application requirement.

achieving whole-farm nitrogen balance, dairy discharges to groundwater would not unreasonably affect beneficial uses.[233]

In Section III.A.3, we identified the potential development of land application milestones based on the whole-farm-balance concept and strategy—but only as a potential interim milestone. Whether or not the Central Valley Water Board chooses to include whole-farm nitrogen balance as an interim milestone in the revised dairy general waste discharge requirements, we believe that the whole-farm nitrogen concept should be used, at least in the interim, as a complementary *accounting* approach that dairies will use in addition to the A/R approach to measure compliance with the interim and final numeric land application rates. Unlike the A and R approach that quantifies the amount of nitrogen that is applied to and removed from the fields via direct measurements, the whole-farm nitrogen accounting approach attempts to quantify the total amount of nitrogen in the dairy manure that a dairy generates, and therefore must account for through export, land application and removal, retention pond leakage, volatilization, or otherwise.[234] To develop a technically-sound whole-farm nitrogen accounting approach, we task the Central Valley Water Board with consulting with State Water Board staff, technical experts and dairy industry representatives and other stakeholders, including community representatives, to obtain information and evaluate the technical issues pertinent to developing a whole-farm nitrogen accounting approach. Such technical issues include identifying a fixed amount of nitrogen generated per cow, based on the type of cow (e.g., age, sex, milking, etc.); the volatilization rate of nitrogen; quantification of the amount of nitrogen treated or exported, and any other issues necessary for a technical accounting for all nitrogen inputs and outputs occurring on a dairy. In the interest of promoting the development of a scientifically sound whole-farm nitrogen accounting approach, we also require that the Central Valley Water Board have its whole-farm nitrogen accounting approach independently peer reviewed in a manner

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[233] *Ibid*.

[234] We expect that the nitrogen losses to groundwater from existing dairy manure retention ponds would be based on actual, not estimated, pond leakage rates. The Central Valley Water Board may conclude that dairy manure retention ponds that are constructed in accordance with the default pond construction requirement described in Section III.B.3 should be assumed to have zero leakage.

similar to that required by Health and Safety Code 57004. Although the external peer review requirements of section 57004 do not apply to this order, as previously discussed, using this process ensures that this recommended component is scientifically sound. We expect the peer review process will consider on-farm scientific feasibility to ensure the whole-farm nitrogen accounting approach be implementable.

The Central Valley Water Board is directed to take the lead in working collaboratively with interested parties and our staff to determine what appropriate data dairies should report to support the development and use of the whole-farm nitrogen accounting approach. Such data may include, for example, the herd size, type of cows, amount of fertilizer application, amount of cropped acreage and types of crops, amount of manure exported or treated,[235] the herd's total excreted manure in liquid and solid form, volatilization loss, the amount of milk produced in lactating cows, dry matter intake, concentration of crude protein of total ration provided to heifers, amount of acreage to which liquid and solid manure is applied, amount of acreage to which manure is applied by a third party, the amount of acreage applied to leguminous crops, the amount of nitrogen uptake in the various types of crops, the yield of the crops, and the amount of nitrogen in irrigation water and the volume of water applied. The Central Valley Water Board's determination of the appropriate data, as well as the measures and tools discussed in Section III.A.5.a, needed for dairies to evaluate and report whole-farm nitrogen accounting more accurately is subject to scientific peer review and shall be submitted as part of the Central Valley Water Board's peer-review package submitted for the whole-farm accounting approach. The data ultimately identified as needed to accurately evaluate a dairy's performance by using the whole-farm nitrogen accounting approach will be incorporated into the revised dairy general waste discharge requirements.

This schedule requires that peer review of the whole-farm nitrogen accounting approach will occur before the Central Valley Water Board adopts its revised dairy

[235] "Treated" refers to any engineered treatment or manure management process (e.g., biological filtration, physical nutrient recovery, chemical transformation, or other process that results in denitrification), that quantifiably removes nitrogen from manure that can be incorporated into the R value of the mass balance calculation.

general waste discharge requirements. For that reason, we recommend the Central Valley Water Board initiate its consultation with technical experts and others regarding the whole-farm nitrogen accounting approach as soon as possible.

5. Additional Land Application Elements

The CVDRMP's SRMR identifies a package of technical recommendations for improving land application practices to be implemented in the near term. We generally agree with most of the CVDRMP's SRMR's recommendations. While the following elements are too specific and generally involve too much discretion to be identified as required components of the regulatory framework for nitrogen discharges, we direct the Central Valley Water Board to address the following specific near-term measures in either 13267 Orders or its revised dairy general waste discharge requirements consistent with our discussion of each near-term measure, below. The Central Valley Water Board may, of course, include any additional requirements in the revised dairy general waste discharge requirements as it deems appropriate.

a. Measures for More Accurate Whole-Farm Nitrogen Accounting

First, measures and tools for collecting data to improve the accuracy of whole-farm nitrogen accounting are required to be developed by the Central Valley Water Board. These measures and tools must be included in the revised dairy general waste discharge requirements and submitted for scientific peer review before adoption (Section III.A.4). The Central Valley Water Board has the discretion to tailor appropriate implementation deadlines related to its specified measures and tools. These could include utilizing the specified sampling protocols for solid manure to estimate the amount applied to fields or exported[236] and installing electronic flow meters for liquid manure application to fields and related operational protocols.[237] These measures will aid the development of the whole-farm nitrogen accounting approach which will develop the quantification of the herd's excretion rate, aid the partitioning of nitrogen in the solid

[236] CVDRMP Summary Representative Monitoring Report, p. 53, § 2.5.1.
[237] *Id.*, pp. 53-54, § 2.5.2.

and liquid manure, improve sampling protocols for solid and liquid manure and improve estimates of the nitrogen in the harvest removed from fields.[238] While these measures do not directly measure herd nitrogen excretion or crop nitrogen removal, they improve the accuracy of manure quantity and nutrient content data. Reasonably accurate measures are critical for dairies to develop more accurate accounting of the amount of nitrogen they are generating, as well as its fate. While there may be some overlap between the development of these measures and tools for the whole-farm nitrogen accounting approach and requirements in Section III.A.5.f for improving the nitrogen applied and nitrogen removed measurements and reporting approach, we view the two approaches as important data-driven methodologies that, at least for now, should complement each other in helping to ensure that the Nitrogen Discharge Limit is ultimately achieved.

b. Continue Using the CVDRMP's Representative Well Monitoring Program

Second, the CVDRMP's representative well monitoring program, including any future adjustments determined to be appropriate by the Central Valley Water Board, should continue to be used. The CVDRMP's representative well monitoring network monitors only a fraction of all the dairies (approximately 400 wells at 40 of the approximately 900 dairies in the Central Valley), but the process that the CVDRMP used to select a representative subset of dairies to monitor was reasonably robust and scientifically sound. The process was peer reviewed and included input from academia. The number and placement of monitoring wells at each representative dairy (approximately 10 wells per dairy) provides for a reasonable assessment of conditions at each representative dairy. We have concluded that the monitoring network generally appears to provide data that is sufficiently representative of nitrogen impacts to groundwater at the non-monitored sites for programmatic purposes. The Central Valley Water Board may wish to consider incorporating additional representative groundwater quality monitoring wells, as well as relevant data from other established regulatory programs—such as the Groundwater Sustainability Plans (GSPs) developed per the

[238] *Id.*, pp. 54-55, § 2.5.3.

Sustainable Groundwater Management Act (SGMA), Irrigated Lands Regulatory Program (ILRP), and CV-SALTS Salt and Nitrate Control Programs—to further strengthen the representativeness or robustness of the groundwater well monitoring network.

In their letter commenting on our October 1, 2024, draft order, petitioners and other entities contend that our conclusion that the representative well monitoring network appears to provide representative groundwater data for non-monitored sites is not consistent with the NPS Policy because the network fails to meet Key Element 4. Key Element 4 requires a nonpoint source control implementation program to include sufficient feedback mechanisms to track whether the program is achieving its stated purpose.[239] Their contention is based on an incorrect interpretation of our endorsement of the monitoring network. We have not found or concluded that the monitoring network can adequately track whether all dairies (monitored or unmonitored) *are complying with permit conditions*. As previously stated, we only find that the network appears to provide data that is sufficiently representative of nitrogen impacts to groundwater *at the non-monitored sites* (i.e., whether groundwater quality is improving or worsening) at a programmatic level. Additionally, and more fundamentally, their contention presumes this order itself must implement the Nonpoint Source Policy. This order does not directly authorize or regulate discharges, require management practices, establish time schedules, nor ensure enforcement. It provides an overarching regulatory approach for the Central Valley Water Board to implement in future regulatory proceedings. Accordingly, the order is not itself a regulatory mechanism to control nonpoint source discharges and therefore is not independently required to satisfy each element of the Nonpoint Source Policy.[240, 241]

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[239] Nonpoint Source Policy, p. 13.

[240] *Environmental Law Foundation. v. State Water Resources Control Bd*. (2023) 89 Cal.App.5th 451, 486-487; Nonpoint Source Policy, p. 8 (defining nonpoint source control implementation programs as programs developed to comply with waste discharge requirements, waivers of waste discharge requirements, basin plans, or prohibitions).

[241] Petitioners and other joint commenters also urged the State Water Board to require that the Central Valley Board expand the CVDRMP to include vadose zone monitoring recognizing its potential value for providing early indications of leaching below the root

On remand, the Central Valley Water Board's implementation of the order's directives and regulatory framework must implement the Nonpoint Source Policy's directives. Among them, revised dairy general waste discharge requirements should describe the measures that will be used to verify the degree to which the management practices are being properly implemented and achieving water quality requirements and provide feedback for use in adaptive management as necessary to determine whether the program is functioning on time and is on track with achieving its stated goals.[242]

c. An Increased Role for the CVDRMP

Third, the Central Valley Water Board should strongly consider an increased role for the CVDRMP in the revised dairy general waste discharge requirements. The CVDRMP proposes a role similar to that of an irrigated lands regulatory program approved third-party group to help with administering the CVDRMP's recommendations. As we explained in the Nonpoint Source Policy, third parties can help to leverage limited staff resources by interacting directly with the dischargers, including providing technical support and assisting with data collection and reporting.[243] Specifically, the CVDRMP's SRMR proposes to take on a broader role in analyzing its dairy members' submitted data, tracking the industry's performance, monitoring progress with respect to whole-farm balance and compliance with educational requirements, and continuing groundwater monitoring and reporting activities.[244] The Central Valley Water Board should set clear roles and reporting obligations for the CVDRMP or other approved representative monitoring groups, which may include reporting of appropriate data in an approved format into GeoTracker on behalf of their members.

There are, however, important differences between third parties for irrigated lands and third parties for dairies. As we explained above, dairies' historic and current land application of dairy manure has functioned primarily as a method of manure

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zone. However, groundwater monitoring is the most reliable method for evaluating water quality. Combined with A and R data, it enables nitrogen mass balance calculations. Additionally, vadose zone monitoring requirements would face numerous challenges and are impractical at scale at this time.

[242] Nonpoint Source Policy, pp. 13-14.

[243] Nonpoint Source Policy, pp. 8-9.

[244] CVDRMP Summary Representative Monitoring Report, p. 33, § 2.1.2.

management, unlike traditional growers' land application of fertilizers primarily to grow crops. Further, the dairy industry has a history of regulation that includes direct reporting to the Water Boards, including in the 2013 Dairy General WDRs. For these reasons, unlike the third-party approach we described in our Order WQ 2018-0002, we have concluded that any form of anonymized reporting for dairies by the CVDRMP would be inappropriate.

d. Education to Improve Nitrogen Efficiency

The CVDRMP's SRMR recommends that the revised dairy general waste discharge requirements include a requirement that dairy operators complete a basic course on improving nitrogen uptake efficiency. The CVDRMP's SRMR requests that the course be developed by the California Dairy Quality Assurance Program working in collaboration with the CVDRMP, the Central Valley Water Board, the University of California Cooperative Extension, and other interested parties. The purpose of the course is to help dairies better understand how to calculate whole-farm nitrogen supply and demand, improve nitrogen use efficiency in forage crops used in land application, and learn strategies to manage and export solid and liquid manure.[245]

The CVDRMP's SRMR also recommends that additional educational opportunities be offered to dairies on a voluntary basis, all geared towards a more detailed understanding of increasing nitrogen use efficiency. The CVDRMP's SRMR identifies the following topics that it would develop into an educational program: various courses on the proper way to use flow meters, sample collection methods, and improved reporting mechanisms; proper manure and harvest sampling techniques; strategies for increasing irrigation efficiency and distribution uniformity; introduction of innovative irrigation systems; alternative strategies for manure management; and the availability of incentive programs (e.g., grant funding) and other related topics.[246] The CVDRMP's SRMR envisions that it and the California Dairy Quality Assurance Program will play an active role in leading these educational opportunities, working in concert with non-governmental organization partners, trade organizations, and relevant

[245] *Id.*, p. 19, § 1.5.4
[246] *Id.*, p. 11, § 1.5.1.5, p. 19, § 1.5.4.

government agencies, including the California Department of Food and Agriculture and the United States Department of Agriculture's Natural Resources Conservation Service. We agree that these or similar opportunities will be beneficial and should be included in the revised dairy general waste discharge requirements.

e. Replace the Strict Field-By-Field Accounting with a Pragmatic Approach of Grouping Fields

The CVDRMP's SRMR states that the strict field-by-field accounting scheme for nitrogen inputs and outputs required by the 2013 Dairy General WDRs is ineffective and impractical, due primarily to challenges in accurately quantifying individual crop field liquid nitrogen manure applications.[247] The CVDRMP's SRMR explains that examples of these challenges include: multiple fields being irrigated and receiving manure applications simultaneously but without the ability to separately account for those applications; tailwater runoff from one field being used as irrigation water for another field; and crops being harvested on an overlapping basis and not on a per-field basis. As a result, the CVDRMP's SRMR concludes that the A/R ratios reported by the dairies are estimates based on broad averaging schemes and do not represent accurate individual field calculations.[248]

In recognition of those practical difficulties, the CVDRMP's SRMR recommends dairies be allowed to group fields or portions of fields in a practical manner that provides flexibility to dairies. We agree that reporting for multiple fields should be permissible in both the 13267 Orders and the revised dairy general waste discharge requirements, but only to the extent that the reported area has the (1) same crop type, (2) the same fertilizer inputs, (3) the same irrigation management, and (4) the same land application practices. This is consistent with the approach we took in Order WQ 2018-0002.[249]

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[247] *Id*., p. 32, § 2.
[248] *Id*., p. 37, § 2.2.2.
[249] State Water Board Order WQ 2018-0002, pp. 30-31, fn. 88 and accompanying text.

f. Irrigation and Nitrogen Management Plan Reporting Requirements

The CVDRMP's SRMR generally endorses many of the irrigation and nitrogen planning and reporting concepts we required in Order WQ 2018-0002. Those plans require data analysis with the broad goal of identifying actions that can improve manure and other nitrogen-containing fertilizer application efficiencies and performance in the following year's plan. We direct the Central Valley Water Board to require dairies to annually submit the appropriate elements of Order WQ 2018-0002's irrigation and nitrogen management plans (hereafter generally referred to as INMP) via our GeoTracker database, in collaboration with State Water Board staff to identify more accurate methods for direct measurements of A and R (e.g., electronic flow meters and sampling liquid manure for nitrogen concentration prior to application to fields), the format for reporting the data to GeoTracker and the data elements to be collected. The methods for calculating nitrogen applied should be further expanded after research is completed for the whole-farm nitrogen accounting approach. The multi-year reporting can provide appropriate metrics in assessing trends in the magnitude of any over-application of nitrogen and measurable progress towards reducing the nitrogen loading to groundwater. The multi-year A-R difference information may also be compared to groundwater quality trend monitoring data to evaluate and verify conclusions about the methodologies of management practices.[250]

Although not discussed by the CVDRMP's SRMR, we direct the Central Valley Water Board to require all dairies to annually submit INMP data elements via the GeoTracker database following State Water Board and Central Valley Water Board collaboration on the development of the reporting format and the data elements to be collected. These elements should build on the elements that are already being collected by dairies, and include, at a minimum: number of mature dairy cows and other cattle, commodities grown, location and acreage of land application area per commodity, the assessor's parcel number of the land application area(s), weight or volume of manure

[250] The A-R difference may also be used to inform a dairy's N application practices in relation to other similar farmers, and the information can be incorporated into subsequent N planning to adjust for future N application.

applied per commodity, nitrogen content of manure applied, total nitrogen applied (e.g. fertilizer, organic materials, compost, irrigation water, etc.) in weight or volume per commodity, yield in pounds per commodity, crop coefficient used to calculate nitrogen removed per commodity,[251] total nitrogen removed (yield multiplied by crop coefficient) in pounds per commodity, pounds of nitrogen applied per acre per crop on an annual basis, pounds of nitrogen removed per acre per crop on an annual basis, nitrogen applied per acre per crop over nitrogen removed per acre per crop (A/R ratio) annually and as a 3-year rolling average of the annual A/R ratios per crop, pounds of nitrogen applied per acre per crop minus pounds of nitrogen removed per acre per crop (A-R difference), annually and as a 3-year rolling average of the annual A-R differences per crop, and any other elements needed to assess potential nitrogen impacts to groundwater. If there is no established crop coefficient for a commodity grown, dairies may report only yield until a crop coefficient is established for that commodity.

6. Timeline and Phases for the Establishment of the Land Application Requirements

We are establishing an expedited two-phased approach for the Central Valley Water Board to implement the land application requirements as follows.

a. Phase 1: Issue Water Code Section 13267 Orders

As discussed in Sections I.B and I.F.1, the CVDRMP's SRMR explains that most dairies report an estimated manure nitrogen application, but such reporting is most assuredly inaccurate for numerous reasons. Dairies must move beyond broad estimations to more accurate direct measurements of nitrogen applied and nitrogen removed. If compliance with the currently applicable 1.4 A/R rate imposed by the Central Valley Water Board's 2013 Dairy General WDRs is to be evaluated with any

[251] A crop coefficient is the nitrogen content in the fresh weight of the crop material. The crop coefficient multiplied by the weight of the crop material removed from the field is used to calculate the nitrogen removed via harvest. (See Geisseler, D., et al., Nutrient Management, UC Davis, Geisseler Lab (providing crop coefficients) at <http://geisseler.ucdavis.edu/Project_N_Removal.html> (as of Aug. 22, 2026).)

kind of precision, dairies must implement measures and tools to achieve more accurate accounting of nitrogen applied and removed within its nutrient management plan.

Accordingly, for Phase 1, we are establishing a milestone for the Central Valley Water Board to issue one or more 13267 Orders to all dairies that are enrolled in any of the Central Valley Water Board's dairy waste discharge requirements. These orders must be issued as soon as they are developed, but no later than two years from the date of this order, and must align with the direction in Section III.A.5.f. The orders will specify more accurate methods for dairies to directly measure and report the manure nitrogen applied and removed to GeoTracker. This data will ensure more accurate compliance tracking data with the currently effective 1.4 A/R land application limit in the 2013 General Dairy WDRs or other applicable waste discharge requirements. The Central Valley Water Board shall determine the direct measurement methods in consultation with our staff and interested persons. This should include evaluating and improving current methods to ensure reported data is accurate, usable, and transparent.

The 13267 Orders are to require improved nitrogen applied and removed monitoring and reporting, but they do not create a new compliance obligation; existing dairies (as defined in Section III.A.2.a) remain subject to the 1.4 A/R requirement in the 2013 Dairy General WDRs or other applicable dairy waste discharge requirements. Accordingly, the 13267 Order shall be issued to all dairies that are currently operating within the jurisdiction of the Central Valley Water Board.

The Central Valley Water Board retains discretion to tailor appropriate compliance deadlines to correspond with the specific requirements of the 13267 Orders and the nature of the information it requires, with the expectation that the compliance deadlines for each of its requirements will be as soon as practicable, with straightforward solutions implemented promptly and more complex tools implemented in a timely but realistic manner.

b. Phase 2: Adopt Revised Dairy General Waste Discharge Requirements

In the second phase of implementing this order's land application requirements, the Central Valley Water Board shall adopt revised dairy general waste discharge

requirements that apply to all dairies.[252] The revised dairy general waste discharge requirements will contain all of the components of the regulatory framework, and other appropriate requirements. We are establishing a milestone of no later than five years from the date of this order for the Central Valley Water Board to issue the revised dairy general waste discharge requirements. To help ensure that the Central Valley Water Board stays on track to meet this five year requirement, we are also establishing a milestone of no later than three years from the date of this order for the Central Valley Water Board to issue its first draft of the revised dairy general waste discharge requirements and environmental impact report for public comment, while work continues on developing the whole farm accounting approach and the final numeric land application rates.

The revised dairy general waste discharge requirements shall include all the progressively protective interim numeric land application rates and other interim milestones with associated interim time schedules for compliance as established by the Central Valley Water Board (discussed in Section III.A.3), as well as the whole-farm nitrogen accounting approach that the Central Valley Water Board will develop (discussed in Section III.A.4).

Finally, the Central Valley Water Board will evaluate including the State Water Board's preferred groundwater loading limit and final land application rate formula[253] in its revised dairy general waste discharge requirements. The final adopted revised dairy general waste discharge requirements will include the final numeric land application rates and corresponding final time schedules for compliance (discussed in Section III.A.2).

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[252] Because the regulatory framework applies to all dairies, the Central Valley Water Board shall, at the same time, update all waste discharge requirements that apply to dairies to incorporate all more stringent requirements that implement the regulatory framework, including waste discharge requirements for dairies that utilize anaerobic digesters and co-digesters and individual waste discharge requirements that continue to apply to dairies, if any.

[253] As provided in Section III.A.1, we have established a milestone for our staff to complete the development of the groundwater loading limit and the final land application rate formula no later than four years from the date of this order.

B. Manure Retention Ponds

While the ultimate objective of our new regulatory framework is for dairies to comply with the Nitrogen Discharge Limit for all sources of dairy manure discharges (and other nitrogen-containing fertilizers for the land application areas), the components of our regulatory framework to control discharges to groundwater from dairies' manure retention ponds are informed, in significant part, by the relatively low magnitude of nitrogen groundwater loading from existing manure retention ponds as compared to the loading from land application of dairy manure. The regulatory framework includes a total of four components associated with dairy manure retention ponds: (1) two components for existing[254] ponds that do not have hydraulic continuity to groundwater, (2) one component for existing ponds that may have hydraulic continuity to groundwater, and (3) one component for new ponds and reconstructed existing ponds.[255]

For existing ponds that do not have hydraulic continuity to groundwater, the first component is an interim, quantifiable performance standard to evaluate the ponds' containment effectiveness. To implement this component, we provide a seepage rate

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[254] A manure retention pond is "existing" within the meaning of the regulatory framework established by this order if it was in operation as of the date of this order as part of an "existing dairy" as defined in Section III.A.2.a.

[255] In its letter commenting on our October 1, 2024, draft order, in lieu of the manure retention pond components, the Central Valley Water Board encouraged us to update the statewide regulations we established in 1997 to regulate discharges of animal waste at confined animal facilities. (Cal. Code Regs., tit. 27, subd. 1, ch. 7, subch. 2, art. 1, §§ 22560-22565 (Title 27).) The Central Valley Water Board explained that a regulatory update would provide for statewide consistency and a more transparent and uniform regulatory process. We agree that certain provisions in Title 27 warrant updating on a statewide basis and we will eventually do so. However, such a revision requires a time-consuming rulemaking process that may not account for the urgency associated with the dairies in the Central Valley. As we noted in Section I.C., the Title 27 provisions expressly provide that they are only minimum standards and require the regional water boards to impose additional requirements where needed to protect water quality. (*Id.*, § 22560, subds. (a), (c).) We are therefore retaining the manure retention pond components in the regulatory framework, but with the recognition that we will consider directing our staff to initiate a rulemaking to update some or all of the Title 27 requirements prior to the Central Valley Water Board's adoption of the revised dairy general waste discharge requirements. If we do provide such direction, we will inform the Central Valley Water Board of the scope of the rulemaking to avoid any duplicative efforts.

for the Central Valley Water Board to evaluate as a preferred option. The second component for existing ponds that do not have hydraulic continuity to groundwater is a pond capacity requirement, similar to the capacity requirement in the 2013 Dairy General WDRs.[256] To implement this second component, we provide specific pond capacity requirements to be evaluated as a preferred option.

The component for ponds that may have hydraulic continuity to groundwater is a requirement to replace all ponds that are determined to have hydraulic continuity to groundwater. The mandatory implementation requirement for this component is that all dairies with ponds that may have hydraulic continuity to groundwater, as determined by the Central Valley Water Board, must either demonstrate that their ponds do not have hydraulic continuity to groundwater or replace the pond with a new or reconstructed pond. The Central Valley Water Board must commence implementation of this requirement within one year of this order. However, subject to that requirement, as discussed below, we largely defer to the Central Valley Water Board to determine the appropriate timing, prioritization, and sequencing of dairies in batches, to carry out this directive.

The component for new ponds and reconstructed existing ponds is updated pond construction standards that comply with the Nitrogen Discharge Limit. For this component, we have developed proposed specific implementation requirements; consequently, we direct the Central Valley Water Board to evaluate these as preferred options to implement this pond component.[257]

The CVDRMP's SRMR observed that earthen manure retention ponds that do not have hydraulic continuity to groundwater and are properly managed to maintain the integrity of the ponds' containment, including the sealing layer that forms on the bottom of the pond over time, generally discharge much less dairy manure to groundwater via seepage compared to earthen manure retention ponds that do have hydraulic continuity

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[256] 2013 Dairy General WDRs, p. 14, § B.1.

[257] Ponds subject to this order do not include ponds that are regulated under a separate digester order (see footnote 5), but insofar as the water quality protections recommended in this order are relevant to digester ponds, we strongly recommend that the Central Valley Water Board consider them in the future development of waste discharge requirements for digester ponds.

to groundwater.[258] We recognize that retrofitting existing earthen manure retention ponds with liner systems can be more expensive and logistically difficult than constructing new ponds with liner systems because the existing ponds must be taken out of service for an extended period of time while the dairy manure continues to accumulate. But we are nonetheless very concerned about earthen manure retention ponds that are in hydraulic continuity to groundwater because their containment features are either nonexistent or not functioning – potentially resulting in very significant loading of nitrogen to groundwater.

1. Existing Manure Retention Ponds that do not have Hydraulic Continuity to Groundwater

The regulatory framework includes two components for existing ponds that do not have hydraulic continuity to groundwater. The first component is an interim, quantifiable performance standard to evaluate the ponds' containment effectiveness. Ponds that have a functional leachate collection and removal system are exempt from this performance standard component. The second component is a pond capacity requirement, similar to the pond capacity requirement in the 2013 Dairy General WDRs.[259] We have developed two proposed interim requirements for the Central Valley Water Board's evaluation as the preferred options for implementing these components. We do not propose any final requirements for the Central Valley Water Board to evaluate, so the Central Valley Water Board is free to evaluate and adopt any final requirements for these ponds in the revised dairy general waste discharge requirements as necessary for these ponds to achieve compliance with the Nitrogen Discharge Limit.

For the first component, Central Valley Water Board must impose a quantifiable performance standard for the effectiveness of the ponds' containment system. Our proposed interim requirement for the containment performance standard is a seepage rate of 0.9 millimeters per day, which approximates a seepage rate established by the U.S. Department of Agriculture, Natural Resources Conservation Service. This seepage rate appears to be a reasonable interim approach for existing ponds that are not in

[258] CVDRMP Summary Representative Monitoring Report, pp. 56-57, § 2.7.
[259] 2013 Dairy General WDRs, p. 14, § B.1.

hydraulic continuity to groundwater because the seepage rate is generally consistent with the Tier 2 design standard for new and reconstructed ponds in the 2013 Dairy General WDRs, the amount of loading from these ponds is expected to be relatively small as long as the integrity of the ponds' containment is maintained, and because we expect some denitrification in the soils underlying the ponds. Performing a seepage rate test using a water balance approach requires the hydraulic isolation of the pond under evaluation by controlling operational inflows and outflows and understanding the overall local hydraulic conditions. The seepage rate is computed by measuring the lowering of the water level and subtracting evaporative losses from the water surface. The seepage rate would have to be confirmed by a licensed professional (i.e., a professional engineer or professional geologist licensed in California) and the test be performed every ten years, commencing within three years of the adoption of the revised dairy general waste discharge requirements.

We recommend evaluating compliance with the performance standard for each pond once every ten years to confirm the pond's seal or containment structures are still intact from potential disturbances due to ground subsidence, earthquakes, or damage to the pond bottom from maintenance or some other activity. We leave it to the Central Valley Water Board to determine the best way to schedule all dairies to evaluate compliance with the performance standard over time (i.e., staggering the dates or phased in via an appropriate time schedule), to account for the number of available licensed professionals and Central Valley Water Board staff to review the required submittals. However, the Central Valley Water Board must use a risk-based decision-making framework for such determination, including the proximity to wells used for public water systems and private domestic wells, and risk of groundwater contamination, such as depth to groundwater or other hydrologic conditions, and other relevant factors.

Additionally, we do not propose specific additional requirements for ponds that fail to meet the performance standard. However, we direct the Central Valley Water Board to require interim protective measures when a pond fails the performance standard (and does not meet the definition of a reconstructed pond in Section III.B.3, which would require the installation of a liner). Even without groundwater continuity,

discharges of elevated nitrate concentrations threaten water quality and must be addressed. Such protective measures may include any approach, not necessarily including liners, that is either specified in the revised dairy waste discharge requirements or approved by the Executive Officer, as long as it is designed by a licensed professional engineer to meet the performance standard.

The rationale for this required performance standard and our recommended seepage rate of 0.9 millimeters per day is that pond liners are expensive,[260] and ponds that are not in continuity to groundwater are generally responsible for a small fraction of nitrogen loading from dairies, as discussed in Section I.F.1.[261] This approach would allow dairies that are meeting the interim performance standard to focus their efforts and resources first on reducing land application nitrogen loading.

We recognize that for some dairies, performing the seepage rate test may not be feasible. For example, while valves may be installed to shut off operational inflows, the test is not feasible for those dairies that have only one manure retention pond because generally dairy manure flows are constant over time. Seepage tests are also subject to inaccuracies in measurements due to changes in weather patterns such as precipitation and evaporation; timing and availability of professionals with expertise in performing seepage tests may prove to be cost prohibitive. Also, manure retention ponds with subsurface infrastructure may not be able to feasibly support redirecting flows (for example, to storage tanks) to be able to accurately measure seepage.

Therefore, if the Central Valley Water Board does select a seepage rate as the pond containment performance standard, we recommend that the Central Valley Water Board also consider allowing dairies that cannot feasibly perform the seepage rate test to meet one or more alternative methods to be developed by the CVDRMP, subject to adoption by the Central Valley Water Board in the revised dairy general waste

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[260] Cost estimates to line, rebuild, or relocate existing dairy manure retention ponds are included as an attachment to the 2013 Dairy General WDRs (see Memorandum from John Schaap and Steve Bommelje, Provost and Pritchard, to Theresa A. Dunham, Somach, Simmons & Dunn, *Costs to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons* (Aug. 2013); see also CVDRMP Summary Representative Monitoring Report, § 3.2.5, pp. 75-77.)

[261] CVDRMP Summary Representative Monitoring Report, p. 9, § 1.4.2.

discharge requirements. Additionally, in anticipation of this eventuality, we recommend that the Central Valley Water Board consider requiring the CVDRMP to identify the general characteristics of manure retention ponds for which the seepage rate test cannot be feasibly performed. We emphasize that seepage rate tests are currently the best approach to confirming whether the seepage rate is being met, so they should be required for every existing manure retention pond that does not have hydraulic continuity to groundwater wherever the Central Valley Water Board determines feasible.

Use of the seepage rate is a pragmatic approach that avoids immediate, potentially high costs of installing a full liner. Because the seepage rate is not directly related to meeting the Nitrogen Discharge Limit, we emphasize that our proposed seepage rate containment performance standard is only an interim requirement intended as a first step toward ultimately achieving the Nitrogen Discharge Limit. As stated above, to fully implement this component, the Central Valley Water Board must develop final requirements and a corresponding time schedule in the revised dairy general waste discharge requirements for all existing manure retention ponds that do not have hydraulic continuity to groundwater to ultimately comply with the Nitrogen Discharge Limit, which may include liner requirements or some other final requirements to comply with the Nitrogen Discharge Limit.

As the second component, to ensure that existing retention ponds that do not have hydraulic continuity to groundwater (and new or expanded retention ponds, as discussed in Section III.B.3) have sufficient capacity to properly manage the dairy's manure, we recommend that the Central Valley Water Board add more specificity to the pond capacity requirements already contained in the 2013 Dairy General WDRs when it adopts the revised dairy general waste discharge requirements. Ultimately, this would require all dairies to demonstrate that their retention ponds have sufficient capacity to contain their dairy manure without having to land apply it in amounts that exceed the land application requirements that are in effect for that dairy at any given point in time. We recommend the following requirements:

> Ponds must be designed, constructed, and maintained to prevent conditions contributing to, causing, or threatening to cause contamination, pollution, or nuisance, and must be capable of containing, without overflow or overtopping (taking into consideration the crest of wind-driven waves), all runoff from the working surfaces that discharge into and direct

discharges to the pond in addition to precipitation that falls into the pond from a 25-year, 24-hour peak storm event at a minimum. Ponds must also be sized appropriately to not result in the need to land apply dairy manure in excess of existing land application requirements to create additional pond capacity. Dairies should be directed to account in operation and maintenance plans the amount of material shipped off site and the amount of capacity in ponds.

Dairies should describe the design, operation, and maintenance of the wastewater management system, including water balance calculations and assumptions, accounting for the amount of land available for land application, which may be negligible during storm events, and include contingency plans which may include constructing new or expanded ponds and/or procuring Baker tanks for additional storage to prevent overtopping of the ponds in the event of an anticipated storm event.

2. Existing Manure Retention Ponds that May Have Hydraulic Continuity to Groundwater

Within one year of the adoption of this order, the Central Valley Water Board is directed to *begin* issuing additional 13267 Orders on a prioritized basis to a subset of dairies. The recipient dairies must, within one year of receipt of a 13267 Order, either submit a demonstration of the existing manure retention pond's lack of hydraulic continuity to groundwater, or if the dairy cannot make that demonstration, submit a compliant pond design to replace the existing pond. The design must meet the Tier 1 or Tier 2 pond design required for new and reconstructed ponds under Section C.5.b of the 2013 Dairy General WDRs[262] or a design consistent with the new and reconstructed pond standards in the revised dairy general waste discharge requirements (as described in Section III.B.3) if they have been adopted. The dairies must be required to then construct the new or reconstructed pond within two years of design approval by the Executive Officer. However, the Executive Officer may extend the one-year and the two-year deadlines described in this paragraph for dairies acting in good faith, such as by applying for and receiving grant funding.

The Central Valley Water Board shall prioritize issuing these 13267 Orders to subsets of dairies in batches that it can reasonably manage, considering available staff and workload, using a risk-based framework. The framework should prioritize ponds most likely to intersect groundwater, proximity to public water system wells and private

[262] 2013 Dairy General WDRs, Pond Specifications, Section C.5.b, p. 17.

domestic wells, groundwater contamination risk, and other relevant factors. The Central Valley Water Board shall describe its prioritization and risk-based framework in its next its six-month report (described in Section IV of this order).

A demonstration of lack of hydraulic continuity requires a dairy to submit data that shows that there is no hydraulic connection between the pond and the reasonably anticipated future high groundwater elevation mark, including the capillary fringe. All demonstrations must be confirmed by a professional engineer or professional geologist licensed in California. The Central Valley Water Board shall review all demonstrations to determine whether it concurs that there is no hydraulic continuity; if it does not concur, it shall either require additional information to support the demonstration or require the dairy to submit a proposed pond design for a new or reconstructed pond.

3. New Manure Retention Ponds and Reconstructed Existing Manure Retention Ponds

This component applies to new manure retention ponds[263] and to reconstructed existing manure retention ponds. An existing manure retention pond is considered to be "reconstructed" if either (i) additional infrastructure that either increases the pond's capacity, or modifies the pond's footprint, is added to the existing pond, or (ii) there is a substantial disruption to the integrity of the containment system of the pond (e.g., by removing a significant portion of the sealing layer), in which case the existing pond must be reconstructed. Our proposed implementation requirements for this component include both a default pond construction standard and an alternative pond construction standard. There should be no need for a time schedule to comply with the construction

[263] A dairy manure retention pond is "new" within the meaning of this order if it is constructed after the date of this order or is on a dairy that does not qualify as an "existing dairy" as defined in Section III.A.2.a. Any new ponds that are constructed after the Central Valley Water Board adopts its revised dairy general waste discharge requirements must comply with the default construction standard or alternative construction standard in the revised dairy general waste discharge requirements. Any new or reconstructed ponds that are constructed prior to then are subject to the requirements of the 2013 Dairy General WDRs or other applicable waste discharge requirements.

standards for new manure retention ponds or for planned reconstruction of an existing manure retention pond, but the Central Valley Water Board should consider either including a compliance schedule in the revised dairy general waste discharge requirements or using individual enforcement orders to establish compliance schedules for any unplanned (e.g., resulting from an accidental disturbance of the sealing layer) reconstruction of existing manure retention ponds.

Our proposed default pond construction requirement is a double synthetic liner with a leachate collection system. The leachate collection system would be subject to monitoring requirements, as determined by the Central Valley Water Board. A study that was accepted as supplemental evidence investigated impacts of unlined dairy ponds leaking to the surrounding environment and concluded that the leaks appear to be relatively localized;[264] nevertheless, it is clear that there are impacts to groundwater from unlined ponds. We acknowledge that there is an associated cost with the proposed default pond construction; however, constructing ponds with an appropriate liner system is necessary to prevent discharge of nitrogen to groundwater and ensure long-term water quality protection.

We also propose that the Central Valley Water Board retain the ability to approve single synthetic liners with electrical leak detection and vadose zone monitoring as an alternative to the default construction standard if the dairy can show that there is a vadose zone (which can be created, if necessary, by elevating the bottom of the pond or lowering the water table) and the dairy is able to repair any liner leaks by temporarily diverting the full contents of the pond and the future influent dairy manure stream into another appropriate waste containment unit (such as another pond or a tank).

We further recommend that, if a portion of an existing pond becomes subject to the default construction standard or alternative construction standard, the entire pond should be subject to the applicable construction standard to ensure liner integrity.

With respect to the liners required by the Central Valley Water Board (e.g., our recommended default pond construction standard's double liner requirement or an alternative single liner standard), the Central Valley Water Board shall consider

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[264] See Kyle Parreira, "Process and Cost for Constructing Lined Dairy Ponds" (Dec. 11, 2024) at fn. 67.

requiring that all liners be installed on both the side walls and the bottom of the pond and be designed and constructed under the direct supervision of a professional engineer licensed in California.

Pond liners can leak for a variety of reasons, including poor installation, punctures, degradation from ultraviolet light, or general wear. If the Central Valley Water Board includes a single liner alternative construction standard, the Central Valley Water Board shall consider requiring that any leak must be repaired. If the Central Valley Water Board includes a double liner construction standard, the Central Valley Water Board shall consider adding a requirement that any leak in the uppermost liner above an appropriate threshold rate established by the Central Valley Water Board must be repaired. The Central Valley Water Board should also consider including the pond capacity requirements discussed in Section III.B.1 for all new and reconstructed ponds. Finally, the Central Valley Water Board shall consider including appropriate monitoring requirements for manure retention ponds that are in compliance with the Central Valley Water Board's construction standard(s).

C. Provision of Alternative Water Supplies

The final component of the regulatory framework addresses the provision of safe drinking water to users affected by nitrate contaminated groundwater. As we have discussed, the discharge of dairy manure has resulted in groundwater exceeding the nitrate water quality objective in some areas of the Central Valley.[265] Because of the critical drinking water impacts associated with groundwater nitrate contamination, this final component of the regulatory framework requires all dairies that are determined to be causing or contributing to exceedances of the nitrate water quality objective in groundwater to provide alternative water supplies to any residents who rely on that groundwater.[266] The following discusses the mechanisms necessary to identify nitrate-

[265] The focus of this order is on nitrate in groundwater. To the extent that wells should be sampled for other constituents, we will consider whether it is appropriate for the State Water Board to pay the incremental sampling and analysis costs.

[266] Public water systems as well as operators of domestic wells, should receive alternative water supplies or payments to defray their increased costs incurred for monitoring and treatment of affected water (exceeding the nitrate MCL).

affected wells relied on for drinking water, determine dairy responsibility, and ensure the timely provision of safe drinking water supplies.[267] We use "on-farm wells" to refer to wells located on a dairy's farm, and "off-farm wells" to refer to all other wells used for domestic purposes.

1. Off-Farm Drinking Water Wells

Many dairies within the Central Valley Water Board's jurisdiction are already working as part of a collective with other permittees to participate in management zones established pursuant to CV-SALTS, which are intended to address nitrate impacts to drinking water.[268] Management zone representatives conduct free well-water testing to identify affected drinking water users.[269] Where groundwater within a management zone exceeds the nitrate water quality objective, the management zone participants are required to provide safe drinking water to all residents within the management zone who are adversely affected by discharges of nitrate through phased implementation, including the initial provision of free bottled water deliveries or filling station access.[270]

For dairies that already participate in a management zone, and are already subject to, and complying with, a requirement to provide alternative drinking water supplies, the off-farm well requirements discussed in this section may generally be satisfied by documenting compliance to the Central Valley Water Board. However, the results must be submitted to GeoTracker in an acceptable, usable data format; PDF files are not acceptable for well sampling data submissions.

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[267] While the dairies have the ultimate obligation to comply with these requirements, some or all of them may be satisfied through activities conducted by another entity, on behalf of a dairy.

[268] See generally, CV-SALTS, *supra*, pp. 7-9. We note that CRLA raised concerns about the efficacy of the CV-SALTS water supply programs for non-English speakers in 2023 in its July 30, 2026 comment letter. We hereby direct the Central Valley Water Board to work with the management zones to confirm that all affected residents are able to access well testing and adequate clean water regardless of their English proficiency, and to report its findings during its next annual CV-SALTS report to the State Water Board.

[269] CV-SALTS Management Zone Dashboard at <https://cvsalts.mljenv.com> (as of Aug. 22, 2026).

[270] *Ibid*.

Dairies not participating in management zones must address drinking water impacts caused or contributed to by their discharges. At a minimum, the Central Valley Water Board must require these dairies to sample all private domestic wells that are both located within a minimum one-mile radius of a dairy facility's land application area or manure retention pond and also within an area determined to be within a high risk area for nitrate groundwater contamination by the Groundwater Ambient Monitoring and Assessment (GAMA) program (estimated to be approximately 97 wells),[271] unless the Central Valley Water Board determines a well is not used and will not be used for domestic supply, is not likely to exceed 8.0 mg/L nitrate (as an extra measure of public health protection), or has been sampled within the last five years and the data has been reported GeoTracker, or the well owner has affirmatively declined to consent to sampling after receiving notice from the dairy (which may include the dairy affirmatively declaring the domestic well owner was contacted on three occasions and the dairy has not obtained consent). If well testing results indicate that the nitrate concentration is at or above 7.5 mg/L and the Central Valley Water Board has determined that it is likely that the dairy has caused or contributed to the exceedance, then the dairy will provide recurring annual opportunities for retesting, at no cost to the owner, until the nitrate concentration is less than 7.5 mg/L nitrate. If well testing results indicate that the nitrate concentration is below 7.5 mg/L then the dairy will provide recurring once per-five years opportunities for retesting at no cost to the owner.

The Central Valley Water Board shall direct dairies, under Water Code section 13267, to conduct this sampling within two years of the date of this order. All monitoring results must be submitted to GeoTracker in a usable format, unless the owner of the

[271] State Water Board staff conducted a spatial analysis to estimate how many domestic wells are located within a distance of one mile from dairies in CV-SALTS Non-Prioritized areas. The domestic wells were then assigned a prioritization level using the GAMA ARM 2026 nitrate-risk classifications, specifically identifying which wells fall within high and unknown nitrate risk areas. For the purpose of this analysis, only domestic wells constructed after 1970, as recorded in Department of Water Resources' (DWR) Online System for Well Completion Reports, were considered; other types of drinking water wells were not evaluated because they are typically subject to sampling requirements under existing regulatory programs.

domestic well directs that the results not be submitted to GeoTracker. If the sampling indicates that nitrate contamination extends more than one mile from a dairy, the Central Valley Water Board shall expand the required sampling area for that dairy to include additional domestic wells. We prefer this sampling approach, rather than sampling all wells within a two- or three-mile radius of a dairy as suggested by some commenters, because it is more targeted toward wells that are likely to exceed the nitrate water quality objective.

For any dairy that is not participating in a management zone and is determined to be causing or contributing to an exceedance of the nitrate water quality objective, whether the dairy is located within or outside of the prioritized groundwater basins and sub-basins, the Central Valley Water Board shall promptly require the dairy to provide short-term and long-term alternative water supplies to any resident or user reliant on wells for drinking water and to help defray the costs to public well systems incurred for monitoring and treatment. The Central Valley Water Board should prioritize these efforts based on the State Water Board's Aquifer Risk Map[272] and other drinking water well water quality data.

The obligation for the prompt provision of alternative water can only arise for dairies not participating in a management zone after the determination that the well is affected and, specifically for off-farm wells, only after it is determined that the dairy is causing or contributing to the exceedance of the nitrate MCL. The Central Valley Water Board must act expeditiously to initiate the technical evaluation necessary to support any findings of responsibility regarding an affected off-farm well in the vicinity of a dairy. Therefore, where there is an off-farm well that is exceeding the nitrate water quality objective in the vicinity of one or more dairies, the Central Valley Water Board shall either issue a traditional investigation order under Water Code section 13267 or use the "notice to comply" mechanism under the conditional prohibition authority included in CV-

[272] The State Water Board's interactive Aquifer Risk Map shows potential risk per square mile sections where domestic wells and state small water systems are most likely to draw groundwater exceeding safe drinking water standards based on raw source groundwater quality data. (State Water Board Aquifer Risk Map at <https://gispublic.waterboards.ca.gov/portal/apps/experiencebuilder/experience/?id=18c7d253f0a44fd2a5c7bcfb42cc158d> (as of Aug. 22, 2026).)

SALTS to notify the dairy of the investigation work that it must satisfy.[273] As part of the notice to comply process, the dairy is required to provide facility and discharge information, characterization of the area of contribution (defining the shallow groundwater zone affected by the discharge and ambient water quality), and groundwater nitrate impact analysis.[274] Well testing and any additional investigative work following the notice to comply would proceed pursuant to Water Code section 13267.

If the Central Valley Water Board determines that the dairy has caused or contributed to the exceedance of the nitrate water quality objective in the drinking water well, we expect the Board to promptly issue a clean-up and abatement order. Alternatively, the Board may continue to use the notice to comply process, which requires the discharger to submit an early action plan that includes a process to identify affected residents; specific actions and a schedule to address immediate nitrate issues, including interim provision of safe drinking water; a funding mechanism; and implementation beginning within 60 days of submitting the early action plan.[275]

Because we recognize that it can be time consuming to address alternative water supply issues on an individual dairy or individual community basis, we will make State Water Board staff available to assist the Central Valley Water Board with communities outside of the management zones in high aquifer risk areas where dairies may be affecting drinking water wells, for community outreach and education, and for conducting investigations and, as appropriate, issuing cleanup and abatement orders requiring the provision of short term and long term alternative water supplies. We will

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[273] CV-SALTS, *supra*, p. 60 ("Upon receiving a Notice to Comply from the Central Valley Water Board, discharges of nitrate are prohibited unless a permittee is implementing the requirements of the Nitrate Control Program.") Those requirements include submitting a Notice of Intent under Path A (individual permitting approach) or Path B (management zone approach).

[274] See Notice of Intent Guidance for the Nitrate Control Program's Individual Permitting Approach (Path A) at <https://www.waterboards.ca.gov/cvsalts/forms_temps_guide/nitrate_guidance.pdf> (as of Aug. 22, 2026).

[275] CV-SALTS, *supra*, p. 53.

similarly make staff available to assist other regional water boards where dairies may be affecting drinking water wells.

2. On-Farm Drinking Water Wells

Dairies have a special responsibility to ensure tenants and other users of their on-farm drinking water wells have safe water for domestic use. Therefore, additional monitoring and notification measures are needed to ensure that users of on-farm drinking water wells are informed of any nitrate contamination and provided safe drinking water. For dairies that already participate in a management zone, and the management zone is already subject to, and complying with, a requirement to sample on-farm drinking water wells for nitrate and provide alternative drinking water supplies to on-farm users of drinking water wells, this requirement may generally be satisfied by documenting compliance to the Central Valley Water Board. Additionally, we expect the Central Valley Water Board and State Water Board staff to coordinate to ensure that all data is entered into GeoTracker in an acceptable format while preventing any unnecessary dual reporting.

Due to the potential serious health risks associated with consuming nitrate concentrations that exceed the nitrate water quality objective, we recognize the importance of making accurate, reliable nitrate concentration data available to the consumers of water from wells on dairies and ensuring the nitrate concentration for every on-farm drinking water well is determined through existing data, direct sampling, or a statistically valid projection, and that users are notified of exceedances. This approach is consistent with the requirements that we have previously imposed on irrigated lands regulatory programs in the Central Coast[276] and Central Valley.[277]

Therefore, the Central Valley Water Board, within two years of the date of this order pursuant to Water Code section 13267, shall require dairies to be subject to monitoring and reporting requirements that are designed specifically to identify on-farm drinking water wells with unsafe nitrate levels.[278]. All dairies with on-farm drinking water

[276] WQ Order 2013-0101.
[277] WQ Order 2018-0002.
[278] See, e.g., WQ Order 2013-0101 and WQ Order 2018-0002.

wells shall be required to initially sample all on-farm drinking water supply wells for nitrate concentrations annually.[279] In lieu of one or more annual samples, the dairy may rely on on-farm drinking water well sampling data available from any time within the prior five years.[280] Where existing sampling data indicates that the nitrate concentration was below 8 mg/L for three consecutive annual sampling events, the dairy may thereafter sample every five years instead of annually. An alternative sampling schedule may be required by the Executive Officer at any time as appropriate. Each dairy must ensure that the results of the drinking water well monitoring are submitted to GeoTracker in a usable data format (PDF data submissions are not acceptable).[281]

For dairies subject to this requirement, the Central Valley Water Board shall require that well users receive formal notification if the drinking water well exceeds the nitrate water quality objective of 10 mg/L. The dairy owner must provide notice to users within ten days of the exceedance and send a copy of the notice to the Central Valley Water Board. Where the dairy owner is not the property owner, the dairy owner may choose to provide the notice or instead pass on the results to the property owner within 24 hours of learning of the exceedance; the property owner must then notify the users within nine days of the exceedance and copy the Central Valley Water Board. The Central Valley Water Board may use existing notification templates designed for the Irrigated Lands Regulatory Program's on-farm drinking water well monitoring requirements but should work with interested parties to ensure notification templates are provided in all appropriate languages. The State Water Board expects that the Central Valley Water Board will, where appropriate, act promptly to ensure the dairy or property owner provides users with alternative water supplies.

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[279] We expect the Central Valley Water Board to send biennial mass mailing to all dairies informing them of the new on-farm drinking water well monitoring requirements, which shall be consistent with the requirements of WQ Order 2018-0002.

[280] Including, but not limited to, sampling completed as part of a CV-SALTS Management Zone or a Sustainable Groundwater Management Act (SGMA) Groundwater Sustainability Plan (GSP).

[281] See WQ Order 2018-0002, p. 60.

D. Evaluation of Costs and Benefits of Monitoring and Reporting Requirements

In this order, we direct the Central Valley Water Board to revise the monitoring and reporting requirements of the 2013 Dairy General WDRs by requiring Irrigation and INMP reporting and on-farm drinking water well monitoring. Water Code section 13267 states that "[t]he burden, including costs, of [monitoring and reporting] shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." While there will be additional costs to dairies due to the revised monitoring and reporting requirements compared to the existing requirements in the 2013 Dairy General WDRs, that additional cost bears a reasonable relationship to the benefits to be obtained from the expanded monitoring and reporting requirements. Data elements collected within the INMPs, including nitrogen application and removal data, will help inform development of, and compliance with, the Nitrogen Discharge Limit and land application rate formula and allow evaluation of potential nitrate groundwater impacts. The manure pond demonstration of no hydraulic connectivity to groundwater will help to ensure that manure ponds are not leaking directly into groundwater. On-farm drinking water well monitoring will allow for notification of users consuming drinking water with nitrate levels above the water quality objective.

The INMP reporting outlined in Section III.A.5.f and the whole-farm nitrogen accounting reporting elements in Section III.A.4 will require dairy employee preparation time. It is important to note that some of the elements that we direct the Central Valley Water Board to require dairies report, including fertilizer and manure application, nitrogen in irrigation water, crop acreage, crop type, and nitrogen uptake in the various crop types are elements contained, at a minimum, in the INMP report or are already reported under the 2013 Dairy General WDRs (e.g., herd size). The amount of manure exported or treated, the herd's total excreted manure in liquid and solid form, volatilization loss, the amount of milk produced in lactating cows, dry matter intake, concentration of crude protein of total ration provided to heifers, amount of acreage to which manure is applied by a third party, and the amount of acreage applied to leguminous crops required for the whole-farm nitrogen accounting reporting will require additional dairy employee time. We estimate that these reporting requirements

represent between three and ten hours of dairy employee time, with a cost range of $165 to $1,070, per year.

Dairies with existing manure retention ponds determined by the Central Valley Water Board to potentially be in hydraulic continuity of groundwater issued a 13267 Order are required to submit, within one year of receipt of the 13267 Order, a demonstration of the existing manure retention pond's lack of hydraulic continuity to groundwater or a design for a new or reconstructed pond, as outlined in Section III.B.2.To demonstrate lack of hydraulic continuity to groundwater, dairies would need a licensed professional to conduct data or field evaluations to estimate groundwater levels and pond depths and potential continuity and prepare a geotechnical report demonstrating lack of continuity to groundwater. We estimate that these reporting requirements represent between 12 and 80 hours of a licensed professional's time, with a one-time cost range of $2,000 to $15,000. Dairies issued a 13267 Order as a result of an off-farm drinking water well nitrate MCL exceedance, must collect and report require information to the Central Valley Water Board as outlined in Section III.C.1. We recognize that the cost will be dependent on the type, size, complexity, and amount of required investigative work. However, we estimate that any applicable characterization of the area of contribution and groundwater nitrate impact analysis requirements represent between 10 and 80 hours of a licensed professional's time, with a one-time cost range of $1,200 to $15,000. Any additional well testing requirements under the 13267 Order or alternative water supply requirements should expect costs similar to those of on-farm drinking water well requirements.

As outlined in Section III.D.2, dairies with on-farm drinking water wells not addressed or being sampled under existing programs (e.g., CV-SALTS) will incur new costs for on-farm drinking water well sampling and providing alternative drinking water if necessary. We anticipate the cost of sampling and reporting data of on-farm drinking water wells to be between $200 and $400 per sample.

There are several methods for providing interim alternative water supplies, from providing bottled water in the short term, to drilling new wells or installing water treatment systems in the long term. Where exceedances beyond the nitrate MCL occur in on-farm drinking water wells, we anticipate the cost of providing alternative water

supplies to be between $200 per person annually for bottled water and $2,000 for purchase and installation of an under-sink water treatment system with an annual up-keep cost of $150 to $450. Costs can run into tens of thousands of dollars to drill deeper groundwater supply wells or install wellhead treatment for a public water system.

We acknowledge that dairies not enrolled in the 2013 General Dairy WDRs will likely incur higher costs, as they are not currently reporting or paying third-party membership fees, if applicable.

We also acknowledge the increased role of the CVDRMP outlined in Section III.A.5.c may result in higher operational costs that could be passed on to members in the form of higher membership fees. Any increased education, although not a requirement, may lead to an increased cost to members but will be beneficial to a dairy's nitrogen management.

E. Antidegradation

As we discussed in detail at Section II.B, above, the Antidegradation Policy establishes the requirement that discharges to waters of the state shall be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state. The regulatory framework for nitrogen discharges established by this order provides programmatic-level direction and recommendations for the Central Valley Water Board to ensure that the revised dairy general waste discharge requirements carry out the requirements of state policy and law as reflected in the Water Code, the Nonpoint Source Policy, the Antidegradation Policy, and the applicable Basin Plans. The regulatory framework is intended to enhance water quality and represents a foundational step in the Central Valley Water Board's ongoing effort to ensure all dairy discharges will eventually comply with water quality requirements. Over the long term, the reissued dairy general waste discharge requirements' inclusion of specific implementation requirements consistent with the new regulatory framework will have a significant impact on dairies' manure management, will result in major reductions in nitrogen loading to groundwater, and will have positive health and economic implications for communities reliant on groundwater for drinking water. Because the new regulatory framework for nitrogen discharges is programmatic in nature and leaves

substantial discretion regarding the specific implementation requirements to the Central Valley Water Board, it would be premature for us to conduct an antidegradation analysis at this juncture. The Central Valley Water Board shall conduct an antidegradation analysis and ensure that its revised dairy general waste discharge requirements comply with the Antidegradation Policy.

Because the revised dairy general waste discharge requirements will include one or more time schedules for many of the dairy discharges to comply with the Nitrogen Discharge Limit, which will be determined by the Central Valley Water Board consistent with CV-SALTS—a schedule that is as short as practicable but in no case longer than 35 years, the Central Valley Water Board should presume that some of the discharges that it is authorizing may temporarily degrade high quality waters.

Therefore, the Central Valley Water Board should evaluate the extent to which allowing the protracted, albeit temporary, degradation of any high quality groundwater in the interim is consistent with the maximum benefit to the people of the State, given the economic and social benefits of allowing the discharges versus the water quality impacts and costs to individuals reliant on the receiving groundwater for drinking water, not unreasonably affect present and anticipated beneficial use of such water, and not result, after the expiration of the time schedules, in water quality less than that prescribed by the applicable water quality control plans. We discuss at Section II.B.1 that the maximum benefit analysis helps to ensure that the social costs of groundwater degradation are balanced against the avoided, or delayed, costs of managing the discharge to prevent or minimize degradation. To be clear, the Central Valley Water Board's maximum benefit analysis will be a high-level, programmatic evaluation of readily available data to account for a relevant range of economic and social costs associated with degradation of high quality groundwater due to discharges of manure, as described in Section II.B.1. That range of costs may include, for example, the costs associated with obtaining alternative water supplies, potential health impacts and associated healthcare costs associated with using the degraded water, and the additional financial burdens on community water systems. Further, the Central Valley Water Board must find that the specific implementation requirements in the revised

dairy general waste discharge requirements constitute the best practicable treatment or control.

F. The Human Right to Water

We are mindful of one of our core goals in protecting the quality of waters of the state. We recently recognized the ten-year anniversary of our state's codification of the human right to water.[282] Water Code section 106.3 establishes the policy that all Californians have a right to safe, clean, affordable, and accessible drinking water. Our adoption of Resolution 2016-0010 cements our commitment to considering this right in our actions that involve sources of drinking water.

Although Water Code section 106.3 is not directly applicable to our review of general waste discharge requirements (see our discussion at Section II.C.1), the State Water Board considered this policy in developing this order. The new regulatory framework for nitrogen discharges is designed to ensure dairy discharges meet the Nitrogen Discharge Limit over time. Ultimately, our goal is to help ensure a safe drinking water supply exists for everyone who relies on groundwater that may be impacted by dairy discharges. We find that the adoption of this order supports the human right to water for consumption, consistent with State Water Board Resolution No. 2016-0010.

In their letters commenting on our October 1, 2024, draft order, petitioners (and others) argue that the proposed order does not comply with the statutory recognition of the human right to safe and affordable drinking water because it allows for continued degradation from dairy discharges and lacks measures to prevent ongoing and increasingly severe exceedance of the nitrate water quality objective. It is true that this order does not require dairies to immediately stop causing or contributing to exceedances of the nitrate water quality objective. Yet, section 106.3 does not bar phased compliance or require immediate attainment. It codifies a policy directive that we have considered as we confront the industry-wide practices and legacy contamination involved here. This order acknowledges that immediate compliance by dairies is not feasible and this order's regulatory framework advances stringent new requirements

[282] Wat. Code, § 106.3.

that protect drinking water by requiring dairies to reduce impacts over time with defined limits.

G. The Sustainable Groundwater Management Act

In September 2014, the Sustainable Groundwater Management Act (SGMA)[283] was enacted "to provide local groundwater sustainability agencies with the authority and technical and financial assistance necessary to sustainably manage groundwater."[284] SGMA governs groundwater extraction and its primary goal is to provide for the sustainable management of groundwater basins, defined as the use of groundwater in a manner that can be maintained over the planning implementation horizon without causing undesirable results, including chronic lowering of groundwater levels by achieving and maintaining a balance between groundwater pumping and recharge to ensure the basin is operated within its sustainable yield.[285]

While the Department of Water Resources and the State Water Board provide oversight and enforcement functions, SGMA prioritizes local groundwater management to the greatest extent feasible.[286] Local public agencies must form groundwater sustainability agencies (GSAs) to govern their specific groundwater basins and the GSAs must develop and implement groundwater sustainability plans (GSPs) tailored to local conditions to achieve sustainability within twenty years of implementation.[287] Sustainability is defined as avoiding six specific "undesirable results": lowering of groundwater levels, reduction of storage, seawater intrusion, degraded water quality, land subsidence, and surface water depletion. SGMA defines an undesirable result for degraded water quality as "significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies."[288]

SGMA allows but does not require GSAs to address in their GSPs undesirable results that occurred before and have not been corrected by its effective date, January

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283 Wat. Code, § 10720 et seq. (added by Stats. 2014, ch. 346, § 3).
284 *Id*., § 10720, subd. (d).
285 See generally, *id*., § 10720.1.
286 *Id*., § 10720.1, subd. (h).
287 *Id*., § 10727.2, subd. (b)(1).
288 *Id*., § 10721, subd. (x).

1, 2015.[289] Additionally, “sustainable groundwater management” means “the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.”[290] Accordingly, the definition of undesirable results requires GSPs to focus on whether water quality conditions have degraded as a result of groundwater management actions since the enactment of SGMA.

SGMA requires state agencies, including the State Water Board and the regional water boards to consider the policies of SGMA and any applicable GSPs when issuing orders that affect groundwater.[291] Additionally, SGMA requires GSAs to consider the interests of all beneficial uses and users of groundwater, including but not limited to domestic well owners, public water systems, groundwater dependent ecosystems, and economically disadvantaged communities.[292] There are approximately 80 GSPs in the Central Valley, and almost every GSP identifies all drinking water users as beneficial users that would be the most sensitive or potentially vulnerable to the degraded water quality indicator of undesirable results and cite to Water Code section 106.3. Many GSPs identify nitrate as a constituent of concern and describe the extent groundwater concentrations exceeded the nitrate water quality objective prior to the enactment of SGMA and the nitrate concentrations post-SGMA. SGMA also requires that a GSP include components to address monitoring and management of groundwater quality and groundwater quality degradation and further requires that the GSPs account for migration of contaminated groundwater and efforts to coordinate with regulatory agencies.[293] Thus, SGMA requires the GSAs to coordinate with the regional water boards regarding management of groundwater quality, including the contaminated groundwater at issue in this order.

Under SGMA, the GSPs in critically over-drafted basins must achieve sustainability by 2040, and all other high and medium priority basins under SGMA must

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289 *Id*., § 10727.2, subd. (b)(4).
290 *Id*., § 10721, subd. (v).
291 *Id*., § 10720.9.
292 *Id*., § 10732.2, subds. (a)(2), (b), (c), (i).
293 *Id*., §§ 10727.2, subd. (d)(2), 10727.4, subds. (c), (j).

achieve sustainability by 2042.[294] Importantly, that does not mean GSPs need to address legacy pollution or need to include components to attain applicable water quality objectives within twenty years. Rather, basins must be managed so that groundwater use and management do not cause the undesirable results discussed above.[295]

We have considered SGMA's policies and the legal requirements that GSPs must account for, including those described above in the programmatic context of the regulatory framework adopted by this order. Notably, while CV-SALTS will allow for existing dairies to achieve the Nitrogen Discharge Limit in accordance with a maximum time schedule of 35 years, it also requires the final management zone implementation proposal to explain how the Management Zone intends to coordinate with efforts underway pursuant to SGMA,[296] and encourages the GSAs to participate in and support the Management Zones to "ensure that actions they plan, permit and implement minimize reductions in groundwater quality, while promoting water sustainability."[297]

While we acknowledge and appreciate the coordination that occurs between the Management Zone participants and the GSAs at the early stages of Management Zone development under CV-SALTS, because dairies are such a significant source of nitrates in groundwater, our view is that the Central Valley Water Board should also coordinate with the GSAs as it consider the policies of SGMA and relevant GSPs during its development of the revised dairy waste discharge requirements. We hereby direct the Central Valley Water Board to do so.

H. The California Environmental Quality Act

Under the California Environmental Quality Act (Pub. Res. Code, § 21000 et seq.) (CEQA), a public agency must prepare an environmental impact report for "discretionary projects" it proposes to "approve" so long as the agency action is not

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294 *Id*., §§ 10720.7, subds. (a), (b), 10727.2, subd. (b)(1) (identifying the planning deadline for all applicable basins).
295 *Id*., § 10727.2, subd. (b)(4).
296 CV-SALTS, *supra*, p. 53.
297 *Id*., p. 68.

exempt from CEQA.[298] The Central Valley Water Board was the agency that acted on the 2013 Dairy General WDRs, which it adopted in 2013. The benchmark for the Central Valley Water Board's CEQA analysis was its consideration of the environmental baseline, the "'description of the physical environmental conditions in the vicinity of the project at the time … environmental analysis is commenced.'"[299] The Central Valley Water Board determined the receipt of permit applications from "existing dairies," due by October 17, 2005, for reports of waste discharges, provided the physical description of the dairies (including herd sizes) as they existed as of that time and constituted the environmental baseline for the CEQA analysis for the dairy general waste discharge requirements issued in 2007.[300] The Central Valley Water Board concluded that the 2013 Dairy General WDRs issued in 2013 supplemented the regulatory requirements already imposed on the existing dairies pursuant to the 2007 Dairy General WDRs, were designed to enhance protection of groundwater resources, did not authorize the expansion of those dairy facilities and did not provide for coverage for new dairies.[301] As a result, the Central Valley Water Board concluded the 2013 Dairy General WDRs issued in 2013 were exempt from the provisions of CEQA in accordance with several categorical exemptions.[302]

The regulatory framework established by this order charts out a programmatic-level general strategy for the Central Valley Water Board to implement in its revised dairy general waste discharge requirements to ensure all dairies eventually comply with the Nitrogen Discharge Limit for the maintenance and protection of groundwater resources. This order is intended to guide the Central Valley Water Board's reissuance of revised dairy general waste discharge requirements for all dairies in the Central Valley region. We have explained in this order that the new regulatory framework for nitrogen discharges applies not only to the dairies that are formally enrolled in the 2013

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298 Cal. Pub. Res. Code, § 21080, subd. (a).

299 2013 Dairy General WDRs, p. 4, Finding ¶ 19 (quoting Cal. Code Regs., tit. 14, § 15125, subd. (a)).

300 *Id.*, pp. 4-5, Finding ¶¶ 19-20.

301 *Id.*, p. 5, Finding ¶ 20.

302 *Ibid*.

Dairy General WDRs, but to all dairies subject to the Central Valley Water Board's authority, including dairies that have commenced operation or consolidated or expanded since the Central Valley Water Board's adoption of the 2013 Dairy General WDRs, and dairies that may commence operation, consolidate, or expand in the future.

As discussed in detail above at Section III.A, the regulatory framework requires eventual compliance with the Nitrogen Discharge Limit and certain nitrogen accounting and reporting requirements and includes specific proposed implementation requirements for the Central Valley Water Board's evaluation as preferred options as it considers adopting the revised dairy general waste discharge requirements.

While the regulatory framework will require dairies to make improvements to their dairy manure management practices to achieve compliance with the Porter-Cologne Act and applicable policies for water quality control, the specific implementation requirements will be established by the Central Valley Water Board in revised dairy general waste discharge requirements. Without knowing the actual implementation requirements or the timeframes for implementing them, any analysis by the State Water Board of potential environmental effects at this stage, even at a programmatic level, would be premature and speculative at this time.

The Central Valley Water Board is required to comply with CEQA for its development and issuance of revised dairy general waste discharge requirements.[303] To the extent that the Central Valley Water Board develops requirements for dairy manure discharges that are not already encompassed by the 2013 Dairy General WDRs,[304] and therefore not accounted for in a prior CEQA analysis, the Central Valley Water Board's environmental analysis shall evaluate any significant direct, indirect, and cumulative effects of regulatory requirements imposed by the revised dairy general waste discharge requirements to be adopted.

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[303] We acknowledge that this will be a significant undertaking, so we pledge to assist the Central Valley Water Board with additional funding and the assistance of our staff for this work.

[304] 2013 Dairy General WDRs, p. 5, Finding ¶¶ 20(a)-(c) (citing California Code of Regulations, title 14, sections 15031, 15032, and 15304, as applicable categorical exemptions).

To be clear, our expression of proposed implementation requirements as preferred options in this order does not in any way restrict the Central Valley Water Board's independent consideration of a full range of project alternatives and feasible mitigation measures that address environmental effects identified through the CEQA process.

I. Public Outreach

In 2022, the state legislature enacted Assembly Bill 2108 (AB 2108).[305] AB 2108 directs the Water Boards to do two things that are relevant to the adoption of this order. First, the Water Boards must

> [e]ngage in equitable, culturally relevant community outreach to promote meaningful civil engagement from potentially impacted communities of proposed discharges of waste that may have disproportionate impacts on water quality in disadvantaged communities or tribal communities and ensure that outreach and engagement shall continue throughout the waste discharge planning, policy, and permitting processes.[306]

We have been mindful to conduct outreach to the many potentially impacted disadvantaged communities and tribal communities as we developed this order. This outreach started with the fourteen ex parte meetings that included representatives of environmental justice organizations, as discussed at Section I.I. We then provided targeted outreach regarding the release of our October 1, 2024, draft order in English and Spanish to representatives of all known environmental justice organizations, tribal communities and disadvantaged communities in the vicinity of dairies. In addition to soliciting feedback on the draft order, we invited them to attend a virtual public workshop on October 30, 2024, where our staff presented the draft order in English and Spanish and answered questions. The workshop was recorded in both languages, and the recordings were posted on the petition web page for this order. Additional opportunities for written public comments were provided on the public drafts of this order that were released on October 1, 2024, and June 15, 2026, and a board workshop was conducted to receive oral comments on the 2026 revised draft order on July 8,

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[305] Cal. Assem. Bill No. 2108 (2021-2022) ch. 347 (adding sections 189.7 and 13149.2 to the Water Code).

[306] Wat. Code, § 189.7, subd. (a)(1).

2026. The Central Valley Water Board is, of course, obligated to continue and refine those outreach efforts as it develops the revised dairy waste discharge requirements.

AB 2108 also requires the Water Boards to make a "concise, programmatic finding on potential environmental justice, tribal impact, and racial equity considerations" when issuing or reissuing regional or statewide waste discharge requirements.[307] This order contains a regulatory framework for the Central Valley Water Board's future incorporation into waste discharge requirements, so it is appropriate for us to make preliminary findings at this stage, to be followed by more specific findings by the Central Valley Water Board during its adoption of the revised dairy waste discharge requirements.

As we have stated throughout this order, historic and ongoing discharges of dairy manure have had very significant water quality impacts on many communities, including disadvantaged and tribal communities. We are adopting this order and its regulatory framework in direct response to those impacts. And we are imposing an obligation to provide alternative water supplies to mitigate those impacts in the interim. As described throughout this Section III and summarized in Section III.J, we are requiring that a truly significant amount of our limited resources be dedicated to addressing the water quality impacts of dairies on these communities. We are directing the Central Valley Water Board to place existing dairies on enforceable schedules with interim and final numeric limitations that will prevent further impacts to the communities that are already impacted as soon as practicable, and to prevent new and expanded dairies from creating such impacts, especially in communities in areas that are not already impacted by dairies.

As the Central Valley Water Board moves forward with developing its revised dairy general waste discharge requirements consistent with this order, we call attention to the public outreach requirements of Water Code section 189.7. We direct the Central Valley Water Board to work directly with leaders and representatives of potentially impacted communities to ensure that the Central Valley Water Board is engaging in truly equitable and culturally relevant community outreach to promote meaningful civic engagement with those communities at all stages of its development of the revised dairy

[307] *Id.*, § 13149.2, subd. (c).

general waste discharge requirements. We further direct the Central Valley Water Board to make appropriate findings in accordance with Water Code section 13149.2 when it adopts the revised dairy general waste discharge requirements.

J. Summary of Major Water Board Tasks

We are tasking the Central Valley Water Board with a truly significant amount of expedited work in this order, with assistance from our own staff. We feel compelled to do so, however, to protect the communities in the vicinity of dairies in the Central Valley that rely on groundwater. For the benefit of all, the major required tasks and associated milestones are summarized as follows:

1. No later than one year from the date of this order: Central Valley Water Board to begin issuing 13267 Orders to a subset of dairies in batches that it can reasonably manage to demonstrate lack of hydraulic continuity between dairy manure retention ponds and groundwater (Section III.B.2).
2. As developed, but no later than two years from the date of this order: Central Valley Water Board to issue 13267 Orders that identify more accurate methods for direct measurements of A and R for more accurate A and R monitoring and reporting (Section III.A.5.f and III.A.6.a).
3. No later than two years from the date of this order: Central Valley Water Board to issue 13267 Orders requiring off-farm and on-farm drinking water well monitoring and, as appropriate, the provision of replacement drinking water (Sections III.C.1 and III.C.2).
4. No later than three years from the date of this order: Central Valley Water Board to distribute its initial draft revised dairy general waste discharge requirements and accompanying draft environmental impact report for public review and comment (Section III.A).
5. No later than four years from the date of this order: State Water Board staff to develop and peer review the groundwater loading limit and the numeric land application rate formula (to be used to determine compliance with the interim and final numeric land application rates) (Section III.A.1).

6. No later than four years from the date of this order: Central Valley Water Board to develop and peer review whole-farm nitrogen accounting approach to be included in the revised dairy general waste discharge requirements (Section III.A.4).
7. No later than five years from the date of this order: Central Valley Water Board to adopt revised dairy general waste discharge requirements (Section III.A.6.b)

IV. ORDER

IT IS HEREBY ORDERED that, for reasons discussed above, the 2013 Dairy General WDRs are remanded to the Central Valley Water Board with direction to initiate the development of revised dairy general waste discharge requirements consistent with this order, and to take the other actions we identify herein, including those specified in Section III.J.

We further direct staff of the Central Valley Water Board, in coordination with our staff, to submit written progress reports every six months, commencing six months after the date of this order, addressing the status of all required tasks assigned by this order to the Central Valley Water Board. State Water Board staff will also submit written progress reports on the same six-month schedule, addressing the status of all required tasks assigned by this order to State Water Board staff. Each six-month report will identify the milestones that are upcoming, currently due, and those that are anticipated in the following years, and provide continuous, rolling tracking of progress made on achieving every milestone or task specified in this order. Each report will also project the progress that will be achieved over the upcoming six month period, and identify any tasks for which there is a significant risk that the associated milestone will not be met and corresponding actions to stay on track. To ensure transparency and ease of public access, the State Water Board will maintain a dedicated web page where each six-month written status report will be posted online, along with links to the board meetings where oral reports are provided.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 15, 2026.

AYE:	Chair E. Joaquin Esquivel Board Member Sean Maguire Board Member Nichole Morgan Board Member Jared Blumenfeld
NAY:	None
ABSENT:	Vice Chair Dorene D'Adamo
ABSTAIN:	None

Courtney Tyler

Courtney Tyler
Clerk to the Board