

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF MARCH 20-22, 2019
Prepared on February 23, 2019

ITEM NO.: 3

SUBJECT: Agricultural Order 4.0 Requirements Recommendations

STAFF CONTACT: Chris Rose, (805) 542-4770 or Chris.Rose@waterboards.ca.gov
Arwen Wyatt-Mair, (805) 542-4695 or Arwen.WyattMair@waterboards.ca.gov
Elaine Sahl, (805) 542-4645 or Elaine.Sahl@waterboards.ca.gov
Paula Richter, (805) 549-3865 or Paula.Richter@waterboards.ca.gov

ACTION: Informational/Discussion

SUMMARY

The current order regulating waste discharges from irrigated agricultural lands, R3-2017-0002, known as Ag Order 3.0, was adopted on March 8, 2017, and is a conditional waiver of waste discharge requirements with a three-year term, expiring March 8, 2020. A replacement order, Ag Order 4.0, is currently under development and is the subject of this agenda item.

Ag Order 4.0 seeks to provide solutions to five water-quality problems associated with agricultural operations. These are:

1. Excessive nitrate discharges to groundwater, causing significant, widespread degradation of drinking water resources;
2. Excessive nutrient discharges to surface waters, causing significant biological impacts;
3. Toxicity from pesticide discharges to surface waters;
4. Wetland and riparian habitat impacts due to agricultural activities and discharges; and
5. Water quality impacts due to excessive sediment discharges.

These five specific water quality problems establish the framework Central Coast Water Board staff has used to communicate potential (as part of November 2018 outreach efforts) and, ultimately, recommended Ag Order 4.0 content, in the form of the five options tables. Staff has updated the options tables presented to the Central Coast Water Board and public during the November 8-9, 2018 meeting. The five options tables were developed as part of the Ag Order 4.0 outreach process and propose requirements and timelines to address the five water-quality problems cited above.

The options tables have been updated to incorporate recommendations provided by stakeholders during a 64-day public comment period, which started on November 19, 2018, as well as those developed through additional, subsequent staff research.

The recommendations provided in the attached options tables set a course that resolves the compelling water quality problems outlined above in a reasonable time, recognizing and allowing for the substantial farming practice adaptation that will have to continue to occur to achieve water quality objectives many decades from now. Staff requests Central Coast Water Board confirmation and/or direction on the proposed conceptual requirements, monitoring and reporting, time schedule, and strategies contained in the options tables.

The proposed requirements include numeric limits and time schedules designed to achieve water quality objectives, protect beneficial uses, and restore beneficial uses where they have been impaired. The requirements incorporate appropriate monitoring and reporting to clearly and reasonably quantify progress towards achieving water quality objectives. The recommendations also include elements that increase the effectiveness of the future order, through phasing, prioritization, and incentives. Following the Central Coast Water Board's direction, staff will prepare draft Ag Order 4.0 with intended release for public comment this summer.

In addition, staff recommends the following:

- Ag Order 4.0 be in the form of a waste discharge requirements (WDR) order instead of a waiver, which the prior three Central Coast Water Board orders have been.
- Continued development of opportunities for third parties to facilitate order implementation. These third-party entities could provide certification incentives or facilitate management practice or monitoring requirement implementation, as a few examples of scope. Staff recommends that this third-party role be structured to include transparency and openness with respect to participants and data, consistent with current practice in the region.

BACKGROUND

Ag Order 4.0 Process and Timeline

Staff developed and has been implementing an outreach plan to solicit stakeholder input throughout the Ag Order 4.0 development process. This plan incorporates lessons learned from previous ag order development processes. Staff has engaged with diverse stakeholder groups early in the order development process via informational and listening sessions and continues to create ample opportunities for dialogue. Additional details, including links to staff reports, presentations, and a log of stakeholder discussions can be found online at:

https://www.waterboards.ca.gov/centralcoast/water_issues/programs/ag_waivers/ag_order4_renewal

In August 2017, staff held a series of listening sessions throughout the region to solicit stakeholder input on areas where Ag Order 3.0 could be improved. At the September 2017 Central Coast Water Board meeting, staff discussed the input received from stakeholders during these listening sessions. At this meeting, the Central Coast Water Board directed staff to provide opportunity for the board to engage throughout Ag Order 4.0's development.

In February 2018, staff released an initial study to begin soliciting input related to environmental review for the California Environmental Quality Act (CEQA). Staff held a series of CEQA scoping meetings throughout the region in March 2018. Input received will be incorporated into

the draft Environmental Impact Report (EIR) that will be released concurrently with draft Ag Order 4.0 this summer.

In March and May 2018, Central Coast Water Board meetings included informational items dedicated to a review of water quality conditions associated with agricultural discharges. The March 2018 informational item focused on surface water quality conditions and agricultural discharges and the May 2018 informational item focused on groundwater quality conditions and nitrate impacts to groundwater. Both informational items incorporated presentations from several outside speakers. Overall, water quality data in agricultural areas indicate that surface water quality and groundwater quality conditions are significantly degraded in many locations throughout the region and are not improving in terms of achieving water quality objectives and protecting beneficial uses.

In September 2018, the Central Coast Water Board meeting was dedicated to a workshop for Ag Order 4.0 stakeholders. Panels of agricultural, environmental, and environmental justice representatives gave presentations to the board in response to a series of questions staff posed:

1. What can growers and the regional board do to demonstrate quantifiable progress to minimize nitrate discharge to groundwater to achieve water quality objectives?
2. What can growers and the regional board do to demonstrate quantifiable progress to minimize nutrient discharge to surface waters to achieve water quality objectives?
3. What can growers and the regional board do to demonstrate quantifiable progress to minimize toxicity in surface waters from pesticide discharges to achieve water quality objectives?
4. What can growers and the regional board do to ensure that riparian and wetland habitat is protected due to agricultural activities and discharges?
5. What can growers and the regional board do to demonstrate quantifiable progress to minimize sediment discharge to achieve water quality objectives?
6. How can the regional board use discharge permit requirements to ensure current and future affordable, safe, and clean water for drinking and environmental uses?

In November 2018, in response to the questions posed above, staff presented a set of five conceptual options tables. The Central Coast Water Board reviewed and discussed the options tables during its November meeting, and a 64-day written public comment period was subsequently launched to solicit more detailed stakeholder input.

November 2018 Staff Report and Presentation

As discussed above and in further detail in the November 2018 staff report¹, in developing the five conceptual options tables staff identified the five primary water quality-related challenges, or components, that must be addressed by Ag Order 4.0: irrigation and nutrient management for groundwater protection, irrigation and nutrient management for surface water protection, pesticide management, sediment and erosion management, and riparian habitat management. The inclusion of these five components was also informed by staff's review of water quality data, presented in the March 2018 and May 2018 staff reports.

¹ November 2018 staff report:

https://www.waterboards.ca.gov/centralcoast/board_info/agendas/2018/november/item5/item5_stfrpt.pdf

Staff also identified certain elements that will result in an effective and legally compliant order: quantifiable milestones, (staff recommends meeting this requirement using numeric limits); a time schedule; monitoring and reporting; a method for prioritization or phasing; and incentives. The November 2018 staff report includes a discussion of several of the individual drivers that informed staff's identification of these elements, including the Nonpoint Source Policy (NPS Policy), the Antidegradation Policy, the State Water Board's order modifying Ag Order 2.0 and the appellate court decision in the subsequent civil lawsuit against the State Water Board, and the precedential components of the State Water Board's Order WQ 2018-0002, which reviews waste discharge requirements that the Central Valley Water Board issued regulating certain agricultural discharges in the Eastern San Joaquin River watershed (ESJ) order. Portions of several of those discussions are included as attachments to this staff report:

- Attachment 2: NPS Policy Five Key Elements
- Attachment 3: Eastern San Joaquin Agricultural Order Precedential Requirements
- Attachment 4: Appellate Court Decision on State Board Modified Order
- Attachment 5: Antidegradation Policy

The NPS Policy identifies five key elements that a program must incorporate when addressing non-point source discharges. The key elements inform regional boards about necessary requirements pertaining to stating specific water quality goals; ensuring the implementation of management practices that will result in a high likelihood of achieving water quality goals; specific schedules and quantifiable milestones to measure progress; sufficient feedback mechanisms to the public; and potential consequences for failure of the program to achieve its stated purpose.

The ESJ order outlines precedential requirements for all regional boards to incorporate in their agricultural orders. The ESJ order includes precedential requirements pertaining to:

- Education and outreach
- Management practice reporting
- Field level management practice implementation data reporting
- Sediment and erosion control practices
- Irrigation and nutrient management planning
- Nitrogen applied and removed reporting (AR reporting)
- AR outlier follow-up
- Drinking water well sampling
- Groundwater trend monitoring
- Development of groundwater protection formulas, values and targets

The Antidegradation Policy requires the regional boards to maintain high-quality waters, defined as the best water quality that existed since 1968, unless the regional board finds that water quality degradation is consistent with the maximum benefit to the people of the state, b) will not unreasonably affect present and anticipated beneficial uses, and c) will not result in water quality less than that prescribed in state and regional policies.

In a published decision, the appellate court that considered the State Board's order modifying Ag Order 2.0 held that the "NPS Policy expressly requires time schedules and quantifiable milestones." Numeric limits are an example of quantifiable milestones.

Staff provides a recommendation in this staff report that is consistent with these policies, the precedential order, and the appellate court decision, while also incorporating recommendations provided by stakeholders through the public comment process.

Water Board staff developed the conceptual options tables as a framework to solve the five water quality issues referenced on Page 8 of this staff report. Using this framework and the options tables, staff then solicited stakeholder input on Ag Order 4.0. The components (the five distinct options tables) and elements (the rows of each table) within the framework, as well as the discussion provided in the November 2018 staff report, were provided to inform stakeholders interested in submitting alternative requirement options regarding what must be incorporated in a proposal to comply with precedent and the relevant plans and policies, detailed above and in the aforementioned attachments.

November 2018 to January 2019 Public Comment Period

On November 19, 2018, staff solicited written public comment on the conceptual options tables. The public comment period was originally scheduled to close on January 18, 2019 and was later extended to January 22, 2019. In the public comment notice, staff provided additional guidance on comments solicited related to the five conceptual options tables, as well as other information relevant to the Ag Order 4.0 development process. Staff solicited input on prioritization and phasing, numeric limits, time schedule to achieve numeric limits, monitoring and reporting, incentives, consequences, CEQA, costs, and alternative options. The public comments are summarized in Attachment 1: Summary of Public Comments and Assessment of Alternative Proposals, and additional information regarding public outreach since November 2018 is outlined in Attachment 8: Summary of Outreach Opportunities.

Staff received 97 comments. Most of the comments received were from growers, advocates for growers, and organizations in the agricultural industry. Two alternative proposals were submitted, one from a group representing agricultural interests and another from a group representing environmental interests.

The proposal from the agricultural interests, referred to as the Ag Organizations proposal, recommends an approach focusing on the implementation, tracking and reporting of best management practices to address water quality issues. The agricultural interests propose that a third-party form to work with growers and regional board staff. This proposal includes an approach where geographic areas, such as subwatersheds, are prioritized to resolve specific water quality issues. Growers in prioritized watersheds would then report efforts to resolve the specific water quality issue, with most emphasis placed on reporting best management practices. The Ag Organization proposal uses receiving water monitoring, such as stream monitoring, to assess whether the management practices implemented in the priority watershed are resolving the water quality issue.

The proposal from the environmental interests, referred to as the Environmental Advocate proposal, recommends an approach focusing on water quality monitoring. The proposal includes an approach where impaired receiving water monitoring results trigger focused attention in a geographic area, such as a subwatershed, where individual ranch discharge monitoring, referred to as "edge-of-field monitoring," could be triggered. The proposal includes the potential for a "collective" to gather information specific to the prioritized area. Specific concentration discharge limits apply both in receiving water and edge-of-field monitoring.

Many of the comments submitted provided specific support for the Ag Organizations' proposal, and many commenters opposed the use of specific discharge limits, particularly at the edge of field. Staff received several comments that vineyards pose a low threat to water quality.

As discussed later in this staff report, the staff recommendation incorporates some recommendations made by commenters. For example, staff has incorporated the concept of prioritizing subwatersheds for follow-up actions, with the intent of allowing a period of time for growers to work directly with a third party, if one forms, to resolve a water quality issue before edge-of-field discharge limits would apply.

Since receiving the public comments, staff has reached out to some commenters to better understand their recommendations and approaches; the results of these conversations are incorporated in the recommendation. Attachment 1 also includes brief evaluations of both submitted proposals with respect to NPS Policy and the ESJ order's precedential components.

Staff currently plans to release the first draft Ag Order 4.0 for public comment in August 2019. Staff plans to consider and incorporate comments received on the draft and will present a final draft for Central Coast Water Board consideration at a meeting in early 2020, ahead of the March 2020 expiration of Ag Order 3.0.

Climate Change Impacts

Climate change will both affect agriculture in the Central Coast and likely exacerbate impacts from the industry. Staff is making a concerted effort to identify the nexus between climate change and water quality impacts from agriculture and integrate this into corresponding program planning. Some of the issues likely to arise as climate change continues to affect the environment include:

- Changes in pollutant concentrations, due to variable rainfall and drought and corresponding water usage changes
- Increase in sediment and erosion problems
- Changing weed and pest pressure on agriculture
- Changes in strategies, including chemical applications, to address changing pest pressure

More discussion on climate change impact evaluation is included in Attachment 6: Nexus to Climate Change.

Human Right to Water

The Irrigated Lands Regulatory Program implements the Central Coast Water Board's Resolution No. R3-2017-0004 regarding the human right to water. The resolution is also a critical component of the Central Coast Water Board's two-part strategy to address the region's severe groundwater nitrate problem:

1. Provide interim replacement drinking water to well users impacted by nitrate pollution
2. Reduce nitrate loading to groundwater to protect current and future drinking water sources

[Human Right to Water Resolution No. R3-2017-0004:](#)

Consistent with the Governor's direction and State Board Resolution 2016-0010, the Central Coast Water Board's Resolution R3-2017-0004 affirmed that the human right to water is a core

value of the Central Coast Water Board and that the realization of the human right to water and protecting human health are the Board's highest priorities. Furthermore, the resolution also states that the Central Coast Water Board will promote policies that advance the human right to water and discourage actions that delay or impede opportunities for communities to secure safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. The Central Coast Water Board is the sole agency with authority to regulate irrigated agricultural discharges to prevent pollution and impacts to drinking water sources, and Ag Order 4.0 is the primary tool to control discharges of nitrate to groundwater from agricultural sources.

REGIONAL BOARD AUTHORITY

Staff has received comments and engaged in discussions with stakeholders regarding the Central Coast Water Board's authority to include several proposed requirements found in the conceptual options tables. Many growers and grower advocates oppose staff's recommendation to include the requirements discussed below; however, staff's assessment is that the requirements are necessary to achieve water quality objectives and beneficial use protection and are within the authority of the Central Coast Water Board to include in Ag Order 4.0.

A detailed narrative is provided in Attachment 10: Regional Board Authority.

TMDLS WITH AGRICULTURAL DISCHARGES AS A SOURCE

Total Maximum Daily Loads (TMDLs) in the Central Coast Region address waterbodies that are impaired due to sediment, pesticides, and nutrients. These TMDLs identify irrigated agricultural lands as sources of pollutants and assign load allocations to discharges from irrigated agricultural lands.

Staff discusses the load allocations assigned in these TMDLs in the numeric limits section of options tables 2 through 4 in the Staff Recommendation section below. TMDLs identify the time required to achieve the TMDLs; these time schedules are considered in the action plans discussed in the Staff Recommendation.

Attachment 7 identifies the TMDLs that will be implemented through Ag Order 4.0, the corresponding pollutant, the load allocation, and the time schedule. Note that the TMDLs in Attachment 7 are for the main stem waterbody associated with the TMDL. Several of these TMDLs also have waterbody tributaries that are not named in the attachment due to the large number of tributaries; staff has provided a range in the load allocation column of Attachment 7 that captures allocations assigned in the TMDL, including to the un-named tributaries.

RECOMMENDATIONS

Waste Discharge Requirements or Waiver of Waste Discharge Requirements

In general terms, WDRs and waivers are similar regulatory tools used by the regional boards for a variety of permitting purposes. Both must comply with all relevant plans and policies and must ultimately require compliance with water quality objectives. Waivers are typically used for lower-risk discharges. Statewide, some regional boards' irrigated lands regulatory programs have adopted waivers and others have adopted WDRs.

A primary difference is that the term of a waiver cannot exceed five years (CWC 13269(a)(2)), while WDRs do not require term limits. If the regional board does not take action to renew a

waiver by its expiration date, then enrollees may experience a lapse in their regulatory coverage. WDRs, on the other hand, do not expire. The regional boards typically revisit WDRs on a predetermined schedule (5, 10, or 15 years) to determine if any updates are necessary, but the risk that regulatory coverage may lapse is not present.

Revisiting permits in their entirety is a time- and resource-intensive task. WDRs can be reworked all at once, just like waivers, or they can be reviewed in more limited ways. For example, a regional board could revise only the groundwater-related components of an adopted WDR order, without making changes to the surface water or riparian habitat-related components. Because of their potential to be longer-term permits, WDRs also provide more stability and consistency to the regulated community and provide staff with more time to implement adopted requirements.

Recommendation: staff recommends that Ag Order 4.0 be developed as WDRs.

Because WDRs do not require a five-year review, staff proposes providing regular updates to the Central Coast Water Board (annual to biennial) covering implementation progress, challenges, data evaluation, and areas of the order that may need to be revisited and/or updated.

Updated Options Tables

In November 2018, staff presented five conceptual options tables to the Central Coast Water Board and public addressing the five main areas of water quality impacts related to irrigated agriculture:

1. Irrigation and Nutrient Management for Groundwater Protection
2. Irrigation and Nutrient Management for Surface Water Protection
3. Pesticide Management for Surface Water and Groundwater Protection
4. Sediment and Erosion Management for Surface Water Protection
5. Riparian Habitat Management for Water Quality Protection

The November 2018 options tables were conceptual in nature and did not include specific time schedules or values for numeric limits and targets. These specifics have been added to the updated tables in this staff report. These table updates were based on both stakeholder input received during the public comment period and research and evaluation performed by staff.

The options tables serve as the framework for a draft order, remaining somewhat conceptual in nature and lacking elements and detail found in draft order language. For example, the options tables do not include findings. After receiving additional input from the Central Coast Water Board and stakeholders during the March 2019 meeting, staff plans to proceed with drafting Ag Order 4.0, scheduled to be released for public review and comment in August 2019.

Examples of factors considered in updating the options tables include:

- Following coordination with the Department of Pesticide Regulation (DPR), staff no longer recommends pesticide application limits in watersheds with persistent pesticide or toxicity problems. Rather, staff now recommends limiting the discharge of pesticides in identified problem areas. Staff will continue to coordinate with DPR on pesticide- and toxicity-related water quality degradation.

- Staff also received comments regarding the benefit of third-party implementation programs. Staff concur and foresee opportunity for such programs to provide compliance assistance (e.g., monitoring, management practice implementation, certification, etc.) to growers to ensure that the discharge limits and water quality objectives are met per the time schedules.

Overall, staff recommends the framework shown in the options tables, including numeric limits, associated time schedules, and monitoring and reporting, to implement an order that ultimately achieves water quality objectives, protects beneficial uses, and complies with relevant policies. Staff also recommends phasing and prioritization and incentives, including third-party programs, as strategies to achieve efficient ag order implementation.

Third-Party Implementation Programs

Staff recommends coordinating and incentivizing the creation of third-party implementation programs. Growers and their advocates have asked for incentives to implement management practices. Implementation of management practices can be incentivized by allowing growers to document what they are implementing and providing acknowledgement of their efforts, and a third-party program could be an effective resource for assisting growers with implementing and documenting management practices.

The expectations of a third-party implementation program would need to be clearly defined. At this time, staff suggests that the clearly stated goal would be to resolve known water quality problems in defined areas, such as subwatersheds, in a given time frame, with a “boots-on-the-ground” approach, while retaining transparency by reporting progress to the Central Coast Water Board and public. There would need to be clear milestones of progress along the way; however, the Central Coast Water Board could allow flexibility so growers and third parties could experiment with ways of solving the water quality problems while reducing the burden associated with reporting to the Central Coast Water Board. The Central Coast Water Board could potentially structure the third parties to meet State Water Board requirements for significant reductions in permit fees, which could serve as an additional, financial incentive to participate in the third-party program.

The path forward includes building a third-party option into draft Ag Order 4.0, and in parallel, developing a third-party scope and expectations document and soliciting potentially interested third parties.

Eastern San Joaquin Order

As described in greater detail in Attachment 3, portions of the State Board’s ESJ order are designated “precedential” for all regional boards implementing irrigated lands regulatory programs, while other portions of the ESJ order apply only to the ESJ watershed. The specific portions that are defined as precedential statewide are described as such in the order. In the ESJ order, the State Water Board acknowledges that “*generally, State Water Board petition orders are precedential unless otherwise designated...here, because of the significant variation in agricultural practices statewide, automatic application of all requirements endorsed in this order to all of the agricultural discharge programs statewide is inappropriate.*” A discussion of the precedential aspects of the ESJ Order, as well as Central Coast Water Board staff recommendations for Ag. 4.0 that satisfy the precedential requirements is provided in Attachment 3. The attachment includes descriptions in the following areas:

- Outreach
- Management Practice Reporting
- Field Level Management Practice Implementation Data
- Sediment and Erosion Control Practices
- Nitrogen Applied and Nitrogen Removed Reporting
- Nitrogen Removal Coefficients
- AR Outlier Follow Up
- Irrigation Management
- Exemption from Nitrogen Management Requirements
- Recordkeeping
- Drinking Water Well Sampling
- Groundwater Trend Monitoring
- Groundwater Protection Formula, Values, and Targets

Discussion of Options Tables

The options tables are included as Tables 1 through 5, corresponding to the same water quality questions outlined in this staff report, and modified from the tables provided during the November 2018 Central Coast Water Board meeting. For each table, the recommended option and elements within that option are in the lightly shaded column titled “Ag Order 4.0 – Updated Option.” This recommended option also corresponds with the third option out of four provided in each table.

Initially, when the framework tables were made public in September 2018, Water Board staff envisioned being able to compare stakeholder options side-by-side with staff-proposed options. Some of the stakeholder options submitted in January 2019 are not in a form that makes this comparison straightforward. Staff have provided narrative comparisons for the two stakeholder options as part of Attachment 1: Summary of Public Comments and Assessment of Alternative Proposals.

Table 1: Irrigation and Nutrient Management for Groundwater Protection

Prioritization or Phasing:

For this table, staff recommends a prioritization focused initially on ranches in areas with the most significant groundwater quality impairments and in groundwater recharge areas. These areas are under the most-significant risk to groundwater quality.

Requirements, including numeric limits and monitoring and reporting, would apply first to ranches in “Phase 1” areas. Requirements would activate later for ranches in Phase 2 and Phase 3 areas; there are three phases recommended. Eventually, all ranches would be complying with similar requirements to protect groundwater quality.

Staff has estimated the number of ranches in each phase and determined that the program has the current resource capacity to implement Ag Order 4.0 in the proposed phased manner.

Numeric Limits:

Staff recommends establishing numeric nitrogen loading limits in the form of nitrogen applied minus nitrogen removed (A-R). The final loading value (for 2050) is based on the assimilative capacity of groundwater basins and ultimately achieves the maximum contaminant limit (MCL) for nitrate in groundwater over a significant amount of time, while accounting for recharge via irrigation water and rainfall. Staff has identified a discharge limit based on the drinking water

MCL and current information including total nitrogen applied (TNA) reporting and the UC Davis Nitrate Report. Establishing numeric limits complies with the NPS Policy requirements, in that these limits clearly lead to meeting water quality requirements, objectives, and restoration of beneficial uses (key element 1 of the NPS Policy) over time. Omission of numeric limits and an associated schedule (discussed below) very likely increases the time necessary to achieve water quality objectives and may result in continued degradation of groundwater resources, along with the associated costs of replacement drinking water.

The State Water Board has not affirmed the A-R discharge limits proposed in the recommendation outlined in Table 1. As such, the proposed A-R discharge limits would not take effect until 2026; prior to 2026, the A-R discharge limits act as targets, that if exceeded, trigger additional actions. The State Water Board may determine that the A-R discharge limits are, or are not, appropriate as a regulatory tool through the process described in the ESJ Order (page 74) including by convening an expert panel. If, through one of these processes, the State Water Board determines before 2026 that A-R discharge limits are not an appropriate regulatory tool, then staff will present a revised agricultural order to the Central Coast Water Board, accordingly. If in their determination State Board provides an alternative limit to the A-R discharge limit, staff will recommend that the board consider incorporating the alternative limit in the revised agricultural order.

In addition to the A-R discharge limit, staff also recommends incorporating a fertilizer nitrogen application limit. Available nitrogen loading data, and associated groundwater-impairment data attributable to these nitrogen discharges, have become available since 2012. Central Coast Water Board staff balances the need for this limit and the growing weight of evidence that nitrate groundwater plumes have increased in many Central Coast basins since 2012, with the understanding that the State Water Board has not supported application limits in orders, inclusive of Ag Order 2.0 (adopted in 2012), to date. The application limit is an interim step designed to help reduce loading while methods for monitoring and reporting nitrogen loading (i.e., A-R) are developed. Staff will develop a fertilizer nitrogen application limit for incorporation in Ag Order 4.0. As stated, this limit will be based on the data collected since 2012 for nitrogen applied and will be designed to prevent overapplication of fertilizer nitrogen.

Staff recommends incorporating follow-up actions as consequences, as required in key element 5 of the NPS Policy, that the Water Board might take if a discharger does not achieve the numeric limits per the time schedule. These follow-up actions could include the potential for limiting fertilizer nitrogen and additional monitoring and reporting.

Time Schedule to Achieve Numeric Limits:

Staff recommends that a time schedule for achieving the final numeric loading limit be included in Ag Order 4.0. Current nitrogen loading rates are significantly higher than the loading limit² necessary to achieve water quality objectives, and a time schedule with stepped check-in points along the way will ensure that progress is made toward achieving the objective. As with other requirements in Table 1, staff recommends that the time schedule for achieving the discharge limit be phased in over time and apply to ranches based on their phase.

Table 1 includes two types of conceptual time schedules: discharge targets and discharge limits. Conceptually, in the discharge target portion of the time schedule, if a discharger does not achieve the target per the time schedule, consequences or requirements such as additional

² May 2018 staff report

monitoring and reporting would be triggered, but the discharger would not be considered in violation of the order. In the discharge limit portion of the time schedule, if a grower does not achieve the limit per the time schedule, the discharger would be in violation of the order. Even in this case, additional requirements such as monitoring and reporting could still be required. In recognition of high nitrate concentrations in groundwater and in irrigation wells, and to incentivize the use of nitrate in that irrigation water in place of new fertilizer nitrogen application, staff proposes an additional compliance pathway. For ranches with high nitrate concentrations in their irrigation wells, growers would be partially limited in the amount of fertilizer nitrogen that could be applied to the crop, but the nitrogen applied with their irrigation water would not be included in the calculation when staff determines compliance with the time schedule. For example, if a discharger were growing lettuce and the irrigation well nitrate concentration was such that the irrigation water alone resulted in an application of 400 pounds/acre of nitrogen to the crop, and the discharger only removed 80 pounds/acre of nitrogen, the discharger would not be able to comply with a 300 pound/acre discharge limit, even if they applied no fertilizer nitrogen. Growers have indicated that this may disincentivize the use of wells with high nitrate concentrations, triggering growers to find different, lower-nitrate sources of irrigation water, and then apply additional fertilizer nitrogen to the crop. Staff has also heard that there might be times when dischargers would need to apply more fertilizer nitrogen than what their irrigation water is able to deliver at a given time during the growing season, even if the concentration of nitrate in the irrigation water is high. With the approach proposed by staff, the example discharger would still be able to apply some fertilizer nitrogen and would not be out of compliance with the time schedule, even if the loading exceeded the discharge limit, in recognition of the fact that the discharger is utilizing significant irrigation water nitrogen in groundwater to grow their crop.

Staff recommends that the nitrogen application limit be applied to all ranches early in the permit. TNA is submitted on March 1 for the previous calendar year. Because it is anticipated that the Board will consider Ag Order 4.0 part of the way through 2020, staff recommends that the initial application limits take effect during 2021, which is the first full year of the TNA monitoring and reporting requirement following the anticipated adoption of Ag Order 4.0.

The proposed timeline for numeric limits balances the urgency driven by the severity of groundwater impacts to the primary drinking water supply, associated costs, and environmental justice considerations with the time necessary for farming practice changes and innovations to occur.

Monitoring and Reporting:

The Irrigation and Nutrient Management Plan (INMP) reporting has been divided into several sections: total nitrogen applied (TNA), removal of nitrogen (sometimes referred to as R), irrigation, and management practice reporting. The TNA requirement staff proposes is an expansion to all ranches of an existing reporting requirement (under Ag Order 3.0) for approximately one-third of enrolled ranches. The Agricultural Expert Panel recommended that all ranches track nitrogen applied (A) and nitrogen removed (R) data (AR), and the ESJ order requires that AR reporting be required for all ranches, with the caveat that the requirement can be phased in over time. The Central Coast Water Board first began requiring TNA reporting in 2014 for 600 ranches and expanded the requirement in 2017 to include 1700 ranches. Staff recommends that Ag Order 4.0 continue to expand TNA reporting to all ranches.

Nitrogen is removed from the field by harvesting plant material that contains nitrogen; it is the "R" portion of the A-R calculation. Staff recommends that removal reporting be phased in over

time, allowing growers time to find the best way to conduct this tracking portion of their INMP. Staff recommends that Phase 1 ranches be required to begin tracking and reporting removal immediately. Staff acknowledges that the 2020 report year likely will not include all crops due to the Ag Order 4.0 anticipated adoption date likely being a few months into the reporting year; staff also acknowledges that there will be a learning curve associated with this new reporting. Staff will take this into account when reviewing the removal information submitted by the Phase 1 growers for the 2020 reporting year.

Staff also recognizes that there are two aspects to the removal calculation: the mass of crop removed from the ranch and the coefficient used to calculate the amount of nitrogen removed through that mass. Staff recommends that Phase 1 growers start tracking and reporting their removal even if coefficients have not been established for all their crops. Staff notes that this approach is similar to the approach taken in the ESJ order. Staff will work with dischargers to establish removal coefficients for all crops grown in the region.

The next section of the INMP is irrigation. Current TNA reporting requires growers to estimate the total volume of water applied to their ranch, to be used in the calculation of the amount of nitrogen applied with irrigation water. Staff recommends phasing in improvements to this portion of the report. Phase 1 dischargers would be required to measure the total volume of water applied to their ranch, rather than estimating it. A reasonable estimate for the volume of water applied to each crop could be accepted. The other pieces of irrigation reporting include reasonable estimates of crop evapotranspiration, for example based on California Irrigation Management Information System (CIMIS) station data, an estimate of the amount of irrigation water that discharged to surface water, and a calculation of the remaining irrigation water that discharged to groundwater. That is, groundwater discharge volume is equal to irrigation water applied minus evapotranspiration minus the estimated volume that discharged to surface water.

The final component of the INMP is management practice reporting, which staff recommends including. The current agricultural order requires management practice reporting of all Tier 2 and Tier 3 ranches; staff recommends expanding this reporting requirement to all ranches.

Staff recommends incorporating the ability to require individual groundwater discharge monitoring for ranches that exceed the numeric target or limit. This would not necessarily be required of all ranches that do not meet the time schedule; rather this would be discretionary. Examples of how dischargers might comply with this requirement include soil monitoring or lysimeter monitoring.

Staff recommends that domestic well sampling, similar to what is required in the current agricultural order, be incorporated in Ag Order 4.0. Staff also recommends including the requirement to perform regional groundwater quality trend monitoring. Both are precedential components in the ESJ order.

Incentives:

Staff has identified several potential incentives in Table 1 and continues to seek out additional potential incentives. Staff recommends incentivizing the use of irrigation water nitrate through the second compliance pathway discussed previously and incentivizing the use of compost due to its soil health benefits. Staff recommends incorporating an incentive for the use of compost, which can increase soil health and water holding capacity and decrease nitrate leaching. This incentive may come in the form of a factor that reduces the amount of compost nitrogen used in the A-R compliance calculations. Staff also recommends that increasing the removal of nitrogen

from the field after harvest be incentivized; this was part of the intent with the development of the A-R metric. Finally, staff recommends continuing to incentivize the creation of third-party compliance assistance and certification programs, potentially by using reduced fees through the State Water Board's fee schedule and by potentially allowing for reduced reporting for program members.

Table 2: Irrigation and Nutrient Management for Surface Water Protection

Prioritization or Phasing:

Staff recommends a prioritization approach where implementation efforts initially occur on ranches in areas with the most significant water quality impairment or those that present the highest risk to surface water quality. Priority watersheds or sub-watersheds will be identified, and implementation work plans will be developed for these areas and implemented according to priority. The work plan would be developed either by staff or by a third-party, in coordination with Central Coast Water Board staff.

With this prioritization, monitoring and reporting requirements would apply to an increasing number of ranches in priority areas of the region; eventually all ranches in areas with surface water quality impairments or those that present the largest risk to water quality will be required to comply with similar irrigation and nutrient management provisions to protect surface water.

Numeric Limits:

Staff recommends numeric receiving water limits that are consistent with total maximum daily load (TMDL) projects (Attachment 7) or, in the absence of a TMDL for a particular constituent, water quality objectives.

The table outlines receiving water limits and discharge limits. A receiving water limit is measured in the waterbody, such as a creek. A discharge limit is measured at the edge of the farm.

In an area with a TMDL schedule, progress is measured by a receiving water limit during the implementation phase of the TMDL schedule; edge-of-farm discharge monitoring is not required during this time. If the receiving water limit is not achieved in accordance with the TMDL schedule, the discharge limit is now effective; exceedance of the discharge limit is a violation of the order, which could prompt a notice of violation or other enforcement options. Achievement of the TMDL will still be measured in receiving waters. Follow-up actions by staff, or potentially a third-party, will occur in order or priority.

In areas without TMDL schedules, the Executive Officer will prioritize areas, such as subwatersheds for follow-up actions by staff or a third-party. The Executive Officer will develop a time schedule to achieve the receiving water quality goal. If the receiving water limit is not achieved in accordance with the schedule, the discharge limit is now effective; exceedance of the discharge limit is a violation of the order, which could prompt a notice of violation or other enforcement options. Achievement of water quality objectives will still be measured in receiving waters.

Time Schedule to Achieve Numeric Limits:

Staff recommends time schedules consistent with the applicable TMDL to achieve numeric receiving water limits and then edge-of-field discharge limits, as necessary. For priority

watersheds and sub-watersheds that do not have TMDLs for particular constituents, the Executive Officer will develop a time schedule to achieve the receiving water quality goal.

Monitoring and Reporting:

Staff recommends that all growers in priority watersheds and sub-watersheds develop and implement a work plan for approval by the Executive Officer and report on their progress to achieve receiving water limits, and then edge-of-field discharge limits, as necessary. Monitoring and reporting could include: 1) irrigation and nutrient management planning and reporting, 2) surface water quality trend monitoring and reporting, 3) follow-up receiving water monitoring and reporting, and then 4) individual discharge monitoring and reporting, as necessary. However, the level of monitoring and reporting could be reduced if a grower or group of growers in a watershed or sub-watershed area can demonstrate that receiving water limits or water quality objectives have been met.

Incentives:

Staff encourages growers to coordinate the effective implementation of water quality improvement efforts and cooperative monitoring and reporting efforts to reduce costs, maximize effectiveness, and achieve compliance. As mentioned previously, a third-party group could optimally fill this assistance role. Staff will continue to search for additional incentive opportunities including potentially certification programs.

Table 3: Pesticide Management for Surface Water and Groundwater Protection

Prioritization or Phasing:

Staff recommends a prioritization approach where implementation efforts initially occur on ranches in areas with the most significant water quality impairment or those that present the highest risk to water quality. Priority watershed and sub-watersheds will be identified, and implementation work plans will be developed for these areas and implemented according to priority. The work plan would be developed either by staff or by a third party, in coordination with the Central Coast Water Board.

With this prioritization, monitoring and reporting requirements would apply to an increasing number of ranches in priority areas of the region; eventually all ranches in areas with water quality impairments or those that present the largest risk to water quality will be subject to similar pesticide management requirements to protect surface water and groundwater.

Numeric Limits:

Staff recommends numeric receiving water limits that are consistent with TMDL projects (Attachment 7), USEPA aquatic life benchmarks or chemical lethal concentrations (Attachment 9), toxic units, and water quality objectives.

The table outlines receiving water limits and discharge limits. A receiving water limit is measured in the waterbody, such as a creek. A discharge limit is measured at the edge of the farm.

In an area with a TMDL schedule, progress is measured by a receiving water limit during the implementation phase of the TMDL schedule; edge-of-farm discharge monitoring is not required during this time. If the receiving water limit is not achieved in accordance with the TMDL schedule, the discharge limit is now effective; exceedance of the discharge limit is a violation of the order, which could prompt a notice of violation or other enforcement options. Achievement

of the TMDL will still be measured in receiving waters. Follow-up actions by staff, or potentially a third-party, will occur in order or priority.

In areas without TMDL schedules, the Executive Officer will prioritize areas, such as subwatersheds for follow-up actions by staff or a third-party. The Executive Officer will develop a time schedule to achieve the receiving water quality goal. If the receiving water limit is not achieved in accordance with the schedule, the discharge limit is now effective; exceedance of the discharge limit is a violation of the order, which could prompt a notice of violation or other enforcement options. Achievement of water quality objectives will still be measured in receiving waters.

Time Schedule to Achieve Numeric Limits:

Staff recommends time schedules consistent with the applicable TMDL to achieve numeric receiving water limits and then edge-of-field discharge limits, as necessary. For priority watersheds and sub-watersheds that do not have TMDLs for particular constituents, the Executive Officer will develop a time schedule to achieve the receiving water quality goal.

Monitoring and Reporting:

Staff recommends that all growers in priority watersheds and sub-watersheds develop and implement a work plan for approval by the Executive Officer and report on their progress to achieve receiving water limits, and then edge-of-field discharge limits, as necessary. Monitoring and reporting could include: 1) pesticide management planning and reporting, 2) surface water quality trend monitoring and reporting, 3) follow-up receiving water monitoring and reporting, 4) drinking water supply well monitoring and reporting, and then 5) individual discharge monitoring and reporting, as necessary. However, the level of monitoring and reporting could be reduced if a grower or group of growers in a watershed or sub-watershed area can demonstrate that receiving water limits or water quality objectives have been met.

Incentives:

Staff encourages growers to coordinate the effective implementation of water quality improvement efforts and cooperative monitoring and reporting efforts to reduce costs, maximize effectiveness and achieve compliance. Staff will continue to search for additional incentive opportunities including potentially certification programs.

Table 4: Sediment and Erosion Management for Surface Water Protection

Prioritization or Phasing:

Staff recommends a prioritization approach where implementation efforts initially occur on ranches in areas with the most significant water quality impairment or those that present the highest risk to water quality based on nutrient and/or pesticide toxicity issues. Priority ranches and watersheds and sub-watersheds will be identified, and implementation work plans will be developed for these areas and implemented according to priority. The work plan would be developed either by Water Board staff or by a third party, in coordination with the Central Coast Water Board.

With this prioritization, monitoring and reporting requirements would apply to an increasing number of ranches in priority areas of the region; eventually all ranches in areas with water quality impairments, or those that present the largest risk to water quality, will be subject to similar sediment and erosion management requirements to protect surface water.

Staff also recommends that sediment and erosion management requirements be prioritized based on site-specific conditions, including impermeable surfaces during the winter, soil type and geology, and slope.

Numeric Limits:

Staff recommends numeric receiving water and discharge limits that protect cold and warm fresh water habitat beneficial uses and are consistent with water quality objectives.

Staff recommends that if cultivation occurs on ranches with impermeable surfaces during the winter months on slopes greater than 10 percent, then the site must have a sediment and erosion control plan designed by a qualified professional.

Staff recommends that no discharge of sediment due to slope failure events may occur at a rate or volume that may cause or contribute to exceedance of water quality objectives.

Staff recommends that stormwater discharge intensity and volume from ranches with impermeable surfaces may not exceed discharge intensity and volume from equivalent non-impermeable area for any storm up to and including a specific design storm.

Time Schedule to Achieve Numeric Limits:

Staff recommends a time schedule to achieve numeric receiving water limits and then edge-of-field discharge limits, as necessary.

Monitoring and Reporting:

Staff recommends that all growers in priority areas and watersheds and sub-watersheds develop and implement a work plan for approval by the Executive Officer and report on their progress to achieve receiving water limits, and then edge-of-field discharge limits, as necessary. Monitoring and reporting could include: 1) sediment and erosion management planning and reporting, 2) surface water quality trend monitoring and reporting, 3) follow-up receiving water monitoring and reporting, and then 4) individual discharge monitoring and reporting, as necessary. However, the level of monitoring and reporting could be reduced if a grower or group of growers in a watershed or sub-watershed area can demonstrate that receiving water limits or water quality objectives have been met.

Incentives:

Staff encourages growers to coordinate the effective implementation of water quality improvement efforts and cooperative monitoring and reporting efforts to lower costs, maximize effectiveness, and achieve compliance. Staff will continue to search for additional incentive opportunities including potentially certification programs.

Table 5: Riparian Management for Water Quality Protection

Prioritization or Phasing:

Staff recommends requirements in Ag Order 4.0 for setbacks and vegetative restoration in priority riparian areas with either severely degraded or high-quality waters. For severely degraded areas, the requirement focuses on restoration; for high-quality areas the requirement focuses on preservation. In all other areas of the region, staff recommends requirements for setbacks with erosion control measures.

Requirements for priority areas includes setbacks and vegetative protection. Staff estimates that approximately 200 farms are located in high-quality water areas representing approximately 145,000 total ranch acres; initial analysis indicates that most of these farms already have adequate setback and vegetative cover. Staff estimates that approximately 260 ranches representing approximately 55,000 total ranch acres are located in severely degraded areas, thereby requiring setback and vegetative restoration implementation.

Staff recommends that dischargers have the option to participate in a third-party watershed restoration program. This cooperative watershed restoration program (CWRP) would serve as an alternative approach to implementing riparian vegetation restoration on individual farms. The CWRP would be operated by a third-party organization. The intent of the CWRP would be to identify restoration opportunities within central coast watersheds, compile fees from qualifying dischargers and identify, implement, and adaptively manage restoration projects to improve water quality. The program would focus on wetland and riparian enhancement projects that benefit basin plan objectives for sediment, toxicity, nutrients, and temperature, and overall beneficial use improvement. Success of the CWRP would focus on identifying projects that offer multiple water quality benefits and support local restoration efforts of a variety of stakeholders.

The proposed prioritization in Table 5 is different from the prioritization or phasing found in the other tables. In Tables 1-4, requirements first apply in the highest priority areas, then are expanded to additional areas, or phased in over time. In Table 5, the setback and vegetative restoration requirements would apply only to the 460 high priority ranches (requirements for erosion control and smaller setback widths still apply to remaining ranches). Under this recommendation, the Board would need to revise the order should the Board wish later to expand the restoration requirements to additional areas.

Numeric Limits:

For high priority areas, staff recommends that setback width and vegetation requirements be based on a stream classification system. Staff recommends the use of the Strahler stream classification system. Staff recommends that class 1 streams such as agricultural ditches be exempt from the setback requirement; however, sediment and erosion control requirements would still apply. For all other waterbodies outside of the priority areas, staff recommends that a setback width be established based on 1.5 times the bankfull width of the waterbody. This requirement applies more broadly to ranches throughout the region, and accordingly has reduced vegetation expectations. The vegetation requirement for the non-priority waterbody areas would focus on sediment and erosion control, rather than the full suite of beneficial uses, such as aquatic habitat and wildlife habitat.

Staff also recommends incentivizing the creation of third-party watershed restoration programs. These programs would identify areas in the watershed where restoration measures could have the largest impact on water quality. Growers participating in the third-party would have reduced individual setback and vegetation requirements on their ranch, defaulting to a minimum setback based on the stream width and erosion control measures. Staff recommends this watershed-level, more holistic approach over an individualized grower approach, because the focus is on areas of greatest water quality benefit in the watershed, rather than on an individual property within a watershed. Staff proposes mitigation ratios as outlined in Table 5.

The current agricultural order includes a prohibition against removing existing riparian vegetation. Staff recommends continuing this requirement in Ag Order 4.0.

Time Schedule to Achieve Numeric Limits:

Staff recommends that separate time schedules for achieving the setback requirements and the vegetation requirements be incorporated. Staff also recommends that requirements related to sediment and erosion control, such as prohibiting bare soil in the setback, apply sooner than the riparian vegetation restoration requirements. Riparian vegetation restoration will require more time for plant establishment than the prohibition against bare soil designed to reduce sedimentation and erosion.

Monitoring and Reporting:

Staff recommends relatively simplified monitoring and reporting compared to what is required for a subset of ranches under the current ag order. Dischargers would be required to report on their setback width, reasonable estimates of the vegetative cover within the setback, and would be required to include a map showing the setback area. For dischargers participating in a cooperative program, the program, not the individual discharger, would report on the implementation and restoration status.

Staff also recommends that regional bioassessment monitoring continue to be performed as part of the cooperative regional surface water quality monitoring program.

Incentives:

Staff recognizes that for riparian habitat management in particular, it is beneficial to take a watershed-based approach. Staff seeks to incentivize this type of approach by allowing dischargers to have a reduced individual setback width and vegetation requirements if they elect to participate in a cooperative program. Staff will also continue to look for additional ways to incentivize habitat restoration and protection.

CONCLUSION

The updated conceptual options tables, originally presented to the Central Coast Water Board and public in November 2018, incorporate stakeholder suggestions received during the comment period and throughout the extensive Ag Order 4.0 outreach process. These proposed updated options tables provide a framework for an order that sets a course for solving the five water quality problems discussed above, complies with all relevant plans and policies, including the NPS Policy, and meets the precedential requirements in the ESJ order.

Staff recommends that Ag Order 4.0 be drafted as WDRs following the framework described in the updated options tables, with the incorporation of incentives and opportunities for third-party implementation programs to provide growers with implementation and tracking assistance.

In September 2017, the Central Coast Water Board requested to be included in Ag Order 4.0's development. To continue with Ag Order 4.0 development, staff requests input and direction from the Central Coast Water Board regarding the options table recommendations included below. Staff will then draft Ag Order 4.0, with release currently planned for August 2019.

TABLES:

1. Irrigation and Nutrient Management for Groundwater Protection
2. Irrigation and Nutrient Management for Surface Water Protection
3. Pesticide Management for Surface Water and Groundwater Protection
4. Sediment and Erosion Management for Surface Water Protection
5. Riparian Habitat Management for Water Quality Protection

ATTACHMENTS:

1. Summary of Public Comments and Assessment of Alternative Proposals
2. NPS Policy Five Key Elements
3. Eastern San Joaquin Agricultural Order Precedential Requirements
4. Appellate Court Decision on State Board Modified Order
5. Antidegradation Policy
6. Nexus to Climate Change
7. Summary of TMDLs with Ag Discharges as a Source
8. Summary of Outreach Opportunities
9. Environmental Protection Agency Aquatic Life Benchmarks
10. Regional Board Authority

TABLE 1: IRRIGATION AND NUTRIENT MANAGEMENT FOR GROUNDWATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 – Updated Option	Ag Order 4.0 (Conceptual Option 2)
Phasing or Prioritization	Tiers are based on ranch characteristics including ranch size, crops grown, specific chemical usage, proximity to impaired surface water, proximity to impaired public supply well.	Phases are based on location-specific conditions such as water quality impairment and risk to groundwater recharge areas.	Phases are based on groundwater quality impairment and groundwater recharge areas. Requirements begin based on ranch phase.	No prioritization or phasing. All requirements apply to all ranches concurrently.
Quantifiable Milestones* (Numeric Limits)	None	Discharge Limit $A_{FER} + A_{IRR} - R = \text{TBD lbs/ac/ranch/year}$ Application Limits A_{FER} cannot exceed TBD lbs/ac/crop <i>Ranches that repeatedly exceed</i> the numeric discharge limit per the time schedule may be limited or prohibited from applying A_{FER} . <i>Relatively higher limits</i>	Discharge Limit $A_{FER} + A_{IRR} - R = 50 \text{ lbs/ac/ranch/year}$ <i>See time schedule</i> Application Limits A_{FER} cannot exceed 500 lbs/ac/crop or a crop-specific value, whichever is less. <i>Ranches that repeatedly exceed</i> the numeric discharge target or limit per the time schedule may be limited from applying A_{FER} or may be required to perform additional monitoring and reporting.	Discharge Limit $A_{FER} + A_{IRR} - R = \text{TBD lbs/ac/ranch/year}$ Application Limits A_{FER} cannot exceed TBD lbs/ac/crop <i>Ranches that repeatedly exceed</i> the numeric discharge limit per the time schedule may be prohibited from applying A_{FER} . <i>Relatively lower limits</i>
Time Schedule*	None	Discharge Limit (lbs/ac/ranch/year) $A_{FER} + A_{IRR} - R = \text{TBD by 20XX}$ $A_{FER} + A_{IRR} - R = \text{TBD by 20XX}$ $A_{FER} + A_{IRR} - R = \text{Discharge Limit by 20XX}$ OR, for ranches with high A_{IRR} $A_{FER} = R \text{ by 20XX}$ <i>Relatively longer time schedule</i>	<i>The following years apply to Phase 1 ranches. For Phase 2 ranches, add 2 years to Phase 1. For Phase 3 ranches, add 4 years to Phase 1.</i> Discharge Target (lbs/ac/ranch/year) $A_{FER} + A_{IRR} - R = 500 \text{ for 2022}$ $A_{FER} + A_{IRR} - R = 400 \text{ for 2024}$ Discharge Limit (lbs/ac/ranch/year) $A_{FER} + A_{IRR} - R = 300 \text{ for 2026}$ $A_{FER} + A_{IRR} - R = 200 \text{ for 2030}$ $A_{FER} + A_{IRR} - R = 100 \text{ for 2040}$ $A_{FER} + A_{IRR} - R = 50 \text{ for 2050}$ OR, for ranches with high A_{IRR} $A_{FER} = R \text{ for 2022}$ Application Limit Application limits begin for all ranches in 2021.	Discharge Limit (lbs/ac/ranch/year) $A_{FER} + A_{IRR} - R = \text{TBD by 20XX}$ $A_{FER} + A_{IRR} - R = \text{TBD by 20XX}$ $A_{FER} + A_{IRR} - R = \text{Discharge Limit by 20XX}$ OR, for ranches with high A_{IRR} $A_{FER} = R \text{ by 20XX}$ <i>Relatively shorter time schedule</i>

TABLE 1: IRRIGATION AND NUTRIENT MANAGEMENT FOR GROUNDWATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 – Updated Option	Ag Order 4.0 (Conceptual Option 2)
Monitoring and Reporting*	<p><u>Total Nitrogen Applied Report</u> <i>A subset of Tier 2 and Tier 3 ranches must monitor and report the following.</i></p> <ul style="list-style-type: none"> a. Nitrogen applied from all sources (A_{FER}, A_{IRR}) b. Nitrogen present in the soil c. Irrigation well concentration d. Irrigation volume applied estimate <p><u>Annual Compliance Form</u> <i>All Tier 2 and Tier 3 ranches must submit information on the following.</i></p> <ul style="list-style-type: none"> a. Irrigation, stormwater, and tile drain discharge to surface water b. Irrigation and nutrient management practices <p><u>Irrigation & Nutrient Management Plan and Effectiveness Report</u> <i>A subset of Tier 3 ranches must develop and implement an INMP considering the following.</i></p> <ul style="list-style-type: none"> a. Nitrogen applied from all sources (A_{FER}, A_{IRR}) b. Crop nitrogen uptake c. Nitrogen removed (R) d. Irrigation and nutrient management practices 	<p><u>Irrigation & Nutrient Management Plan</u> <i>All ranches must monitor the following. Report submittal is based on <u>phase</u>.</i></p> <ul style="list-style-type: none"> a. Nitrogen applied from all sources (A_{FER}, A_{IRR}) b. Nitrogen present in the soil c. Irrigation well concentration d. Irrigation volume applied measurement e. Nitrogen removed (R) f. Crop evapotranspiration g. Irrigation discharge to surface water volume h. Irrigation discharge to groundwater volume i. Irrigation, nutrient, and salinity management practices 	<p><u>Irrigation & Nutrient Management Plan Total Nitrogen Applied (TNA)</u> <i>All ranches begin tracking in 2020 and begin reporting in 2021.</i></p> <ul style="list-style-type: none"> a. Nitrogen applied from all sources (A_{FER}, A_{IRR}) b. Nitrogen present in the soil c. Irrigation well concentration d. Irrigation volume applied -Ranch estimate <p><u>Removal</u> <i>Phase 1 ranches begin tracking in 2020 and begin reporting in 2021. Add 2 years for Phase 2 ranches and add 4 years for Phase 3 ranches.</i></p> <ul style="list-style-type: none"> e. Nitrogen removed (R) -Report total pounds of crop removed until conversion coefficients are established -Report pounds of nitrogen removed after conversion coefficients are established <p><u>Irrigation</u> <i>Phase 1 ranches begin tracking in 2020, begin reporting in 2021. Add 2 years for Phase 2 ranches and add 4 years for Phase 3 ranches.</i></p> <ul style="list-style-type: none"> d. Irrigation volume applied -Ranch measurement, crop estimate f. Crop evapotranspiration g. Irrigation discharge to surface water volume -Ranch estimate h. Irrigation discharge to groundwater volume -Ranch calculation <p><u>Management Practices</u> <i>All ranches begin tracking in 2020 and begin reporting in 2021</i></p> <ul style="list-style-type: none"> i. Irrigation, nutrient, and salinity management practices 	<p><u>Irrigation & Nutrient Management Plan</u> <i>All ranches must monitor the following. Report submittal for all ranches <u>concurrently</u>.</i></p> <ul style="list-style-type: none"> a. Nitrogen applied from all sources (A_{FER}, A_{IRR}) b. Nitrogen present in the soil c. Irrigation well concentration d. Irrigation volume applied measurement e. Nitrogen removed (R) f. Crop evapotranspiration g. Irrigation discharge to surface water volume h. Irrigation discharge to groundwater volume i. Irrigation, nutrient, and salinity management practices

TABLE 1: IRRIGATION AND NUTRIENT MANAGEMENT FOR GROUNDWATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 – Updated Option	Ag Order 4.0 (Conceptual Option 2)
	<p><u>Individual Discharge to Groundwater</u> Not required.</p> <p><u>Drinking Water Supply Well</u> <i>All ranches</i> must monitor all drinking water supply wells present on enrolled parcels, either individually or through a cooperative program.</p> <p><u>Groundwater Quality Trends</u> Not required.</p>	<p><u>Individual Discharge to Groundwater</u> <i>Ranches that exceed the numeric discharge limit per the time schedule may be assigned individual groundwater discharge monitoring.</i> a. Irrigation discharge to groundwater nitrate concentration b. Irrigation discharge to groundwater volume</p> <p><u>Drinking Water Supply Well</u> <i>All ranches</i> must monitor all drinking water supply wells present on enrolled parcels, either individually or through a cooperative program.</p> <p><u>Groundwater Quality Trends</u> <i>All ranches</i> must conduct groundwater quality trend monitoring, either individually or through a cooperative program. <i>Relatively more estimates are accepted in monitoring and reporting.</i></p>	<p><u>Individual Discharge to Groundwater</u> <i>Ranches that exceed the numeric discharge limit per the time schedule may be required to conduct individual groundwater discharge monitoring.</i> a. Irrigation discharge to groundwater nitrate concentration b. Irrigation discharge to groundwater volume</p> <p><u>Drinking Water Supply Well</u> <i>All ranches</i> must monitor all drinking water supply wells present on enrolled parcels, either individually or through a cooperative program.</p> <p><u>Groundwater Quality Trends</u> <i>All ranches</i> must conduct groundwater quality trend monitoring, either individually or through a cooperative program.</p>	<p><u>Individual Discharge to Groundwater</u> <i>All ranches</i> must perform individual groundwater discharge monitoring. a. Irrigation discharge to groundwater nitrate concentration b. Irrigation discharge to groundwater volume</p> <p><u>Drinking Water Supply Well</u> <i>All ranches</i> must monitor all drinking water supply wells present on enrolled parcels, either individually or through a cooperative program.</p> <p><u>Groundwater Quality Trends</u> <i>All ranches</i> must conduct groundwater quality trend monitoring, either individually or through a cooperative program. <i>Relatively more measurements are required in monitoring and reporting.</i></p>
Incentives	Sustainability Certification	Pump & fertilize (see numeric limits section) Additional incentives TBD	-Pump & fertilize (see numeric limits section) -Compost nitrogen: factor may be applied in A-R calculations -A-R calculation incentivizes increased nitrogen removal, rather than only decreasing application -Third-party sustainability certification may result in reduced reporting -Third-party implementation program may result in reduced monitoring and reporting	Pump & fertilize (see numeric limits section) Additional incentives TBD
Definitions	<p>-<i>A_{FER}</i> is the amount of nitrogen applied in fertilizers, compost, and other amendments -<i>A_{IRR}</i> is the amount of nitrogen applied through the irrigation water based on the groundwater nitrate concentration -<i>A_{FER} + A_{IRR}</i> = the total amount of nitrogen applied -<i>R</i> is the amount of nitrogen removed through harvest, pruning, or other methods, plus the nitrogen sequestered in perennial crop permanent wood -<i>A_{FER} + A_{IRR} - R</i> = potential nitrogen waste discharge, or nitrogen loading to groundwater -<i>TBD</i> means “to be determined” and is used as a placeholder for the value of the numeric limits *Required elements; other elements are included because they can help improve the effectiveness of the Order and to solicit stakeholder input</p>			

TABLE 2: IRRIGATION AND NUTRIENT MANAGEMENT FOR SURFACE WATER PROTECTION				
	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
Phasing or Prioritization	Tiers based on ranch characteristics including ranch size, crops grown, specific chemical usage, proximity to impaired surface water, proximity to impaired public supply well.	Phases are based on location-specific conditions such as water quality impairment, high quality surface water, and risk to surface water areas.	Prioritization based on location-specific nutrient water quality impairment, high quality surface water, and risk to surface water areas, and TMDL projects.	No prioritization or phasing. All requirements apply to all ranches concurrently.
Quantifiable Milestones* (Numeric Limits)	None	<p>Discharge Limit Nitrate Concentration= TBD mg/L Ammonia Concentration = TBD mg/L Orthophosphate Concentration = TBD mg/L</p> <p>Application Limit <i>Ranches that repeatedly exceed</i> the nitrate, ammonia and/or orthophosphate discharge limit per the time schedule may be limited or prohibited from applying nitrogen and/or phosphorous from fertilizers, compost and/or other amendments. <i>Relatively higher limits</i></p>	<p>Receiving Water Limit and Discharge Limit Nitrate, as N = 1.8 to 10 mg/L Ammonia (Un-ionized), as N = 0.025 mg/L Orthophosphate, as P = 0.07 to 0.4 mg/L</p> <p><i>Consistent with Total Maximum Daily Load (TMDL) load allocations and/or water quality objectives.</i></p> <p><i>If the receiving water is higher quality water than these limits, the higher quality receiving water shall be maintained, unless degradation is allowed through appropriate findings.</i></p> <p>Application Limit <i>Ranches that repeatedly exceed</i> the nitrate, ammonia and/or orthophosphate discharge limit per the time schedule may be limited from applying nitrogen and/or phosphorous from fertilizers, compost and/or other amendments.</p>	<p>Discharge Limit Nitrate Concentration = TBD mg/L Ammonia Concentration = TBD mg/L Orthophosphate Concentration = TBD mg/L</p> <p>Application Limit <i>Ranches that repeatedly exceed</i> the nitrate, ammonia and/or orthophosphate discharge limit per the time schedule may be prohibited from applying nitrogen and/or phosphorous from fertilizers, compost and/or other amendments. <i>Relatively lower limits</i></p>
Time Schedule*	None	<p>Discharge Limit TBD mg/L by 20XX TBD mg/L by 20XX Discharge Limit by 20XX</p> <p><i>Relatively longer time schedule</i></p>	<p>Receiving Water Limit and Discharge Limit <u>TMDL Areas (TMDL Load Allocations)</u> - Receiving water limits consistent with TMDL time schedules - Discharge limits triggered if receiving water limits not achieved per TMDL time schedule <u>Other Areas (Water Quality Objectives)</u> <i>Example schedule for prioritized watershed:</i> - Receiving water limit achieved by 2027 - Discharge limit triggered in 2027 if receiving water limit not achieved</p>	<p>Discharge Limit TBD mg/L by 20XX TBD mg/L by 20XX Discharge Limit by 20XX</p> <p><i>Relatively shorter time schedule</i></p>

TABLE 2: IRRIGATION AND NUTRIENT MANAGEMENT FOR SURFACE WATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
Monitoring and Reporting*	<p>Annual Compliance Form <i>All Tier 2 and Tier 3 ranches must submit information on the following.</i></p> <p>a. Irrigation, stormwater, and tile drain discharge to surface water b. Irrigation and nutrient management practices</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring Not required.</p> <p>Individual Discharge to Surface Water <i>A subset of Tier 3 ranches must submit information on the following.</i></p> <p>a. Discharge flow rate and volume b. Discharge nutrient concentrations</p>	<p>Irrigation Nutrient Management Plan & Report <i>All ranches must monitor the following. Reporting based on ranch phase.</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Irrigation and nutrient management practices</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring <i>Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned follow-up surface receiving water quality monitoring, performed either individually or through a cooperative program.</i></p> <p>Individual Discharge to Surface Water <i>Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned individual discharge monitoring.</i></p> <p>a. Discharge flow rate and volume b. Discharge nutrient concentrations</p> <p><i>Relatively more estimates are accepted in monitoring and reporting.</i></p>	<p>Irrigation Nutrient Management Plan & Report <i>All ranches must monitor and report:</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Irrigation and nutrient management practices</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring <i>Ranches in prioritized watershed areas that exceed receiving water objectives may be assigned follow-up surface receiving water quality monitoring, performed either individually or through a cooperative program.</i></p> <p>Individual Discharge to Surface Water <i>Ranches in prioritized watershed areas that exceed the numeric limits per the time schedule may be assigned individual discharge monitoring.</i></p> <p>a. Discharge flow rate and volume b. Discharge nutrient concentrations</p>	<p>Irrigation Nutrient Management Plan & Report <i>All ranches must monitor the following. Report submittal for all ranches concurrently.</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Irrigation and nutrient management practices</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring <i>Ranches in all watershed areas that repeatedly exceed water quality objectives may be assigned follow-up surface receiving water quality monitoring, performed either individually or through a cooperative program.</i></p> <p>Individual Discharge to Surface Water <i>Ranches in all watershed areas that repeatedly exceed water quality objectives must perform individual discharge monitoring.</i></p> <p>a. Discharge flow rate and volume b. Discharge nutrient concentrations</p> <p><i>Relatively more measurements are required in monitoring and reporting.</i></p>
Incentives	Sustainability Certification	TBD	-Third-party sustainability certification may result in reduced monitoring and reporting -Third-party implementation program may result in reduced monitoring and reporting	TBD
Definitions	<p>-TBD means "to be determined" and is used as a placeholder for the value of the numeric limits *Required elements; other elements are included because they can help improve the effectiveness of the Order and to solicit stakeholder input</p>			

TABLE 3: PESTICIDE MANAGEMENT FOR SURFACE WATER AND GROUNDWATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
Phasing or Prioritization	<u>Tiers</u> based on ranch characteristics including ranch size, crops grown, specific chemical usage, proximity to impaired surface water, proximity to impaired public supply well.	<u>Phases</u> are based on location-specific conditions including water quality impairment, high quality surface water, and risk to surface water areas.	<u>Prioritization</u> based on location-specific pesticide or toxicity water quality impairment, high quality surface water, and risk to surface water areas, and TMDL projects.	<u>No prioritization or phasing</u> . All requirements apply to all ranches concurrently.
Quantifiable Milestones* (Numeric Limits)	None	<p>Discharge Limit Pesticide Concentration = TBD µg/L Toxicity Test = TBD # of toxic samples allowed Toxic Unit = TBD</p> <p>Application Limits <u>Ranches that repeatedly exceed</u> the pesticide concentration discharge limit per the time schedule may be limited or prohibited from applying that pesticide.</p> <p><u>Ranches that repeatedly exceed</u> the toxicity discharge limit per the time schedule may be required to complete a toxicity identification evaluation to identify chemicals causing toxicity. Ranches may be limited or prohibited from applying the pesticide(s) that caused the toxicity.</p> <p><i>Relatively higher limits</i></p>	<p>Receiving Water Limit and Discharge Limit <u>Pesticide Concentration</u>: TMDL load allocations, EPA Aquatic Life Benchmark(s), or LC50, whichever is lower, and narrative water quality objectives. <u>Toxicity Test</u>: Chronic <i>sediment toxicity</i> will result in at least 80% survival rate in appropriate test species. <u>Toxicity Test</u>: Chronic <i>water column toxicity</i> will result in at least 80% survival and reproduction rates in appropriate test species. <u>Toxic Unit (Sum)</u> < 1.0 TU</p> <p><i>If the receiving water is higher quality water than these limits, the higher quality receiving water shall be maintained, unless degradation is allowed through appropriate findings.</i></p>	<p>Discharge Limit Pesticide Concentration = TBD µg/L Toxicity Test = TBD # of toxic samples allowed Toxic Unit = TBD</p> <p>Application Limits <u>Ranches that repeatedly exceed</u> the pesticide concentration discharge limit per the time schedule may be prohibited from applying that pesticide.</p> <p><u>Ranches that repeatedly exceed</u> the toxicity discharge limit per the time schedule may be required to complete a toxicity identification evaluation to identify chemicals causing toxicity. Ranches may be prohibited from applying the pesticide(s) that caused the toxicity.</p> <p><i>Relatively lower limits</i></p>
Time Schedule*	None	<p>Discharge Limit TBD µg/L by 20XX TBD µg/L by 20XX Discharge Limit by 20XX</p> <p>TBD # toxic samples allowed by 20XX TBD # toxic samples allowed by 20XX Discharge Limit by 20XX</p> <p>TBD Toxicity Unit by 20XX TBD Toxicity Unit by 20XX Discharge Limit by 20XX</p> <p><i>Relatively longer time schedule</i></p>	<p>Receiving Water Limit and Discharge Limit <u>TMDL Areas (TMDL Load Allocations)</u> - Receiving water limits consistent with TMDL time schedule - Discharge limits triggered if receiving water limits not achieved per TMDL time schedule <u>Other Areas (Benchmarks, LC50 and/or Water Quality Objectives)</u> <i>Example schedule for prioritized watershed:</i> - <i>Concentration</i>: No more than three (3) consecutive samples exceed the EPA Aquatic Life Benchmark or LC50, whichever is lower, for 2023</p>	<p>Discharge Limit TBD µg/L by 20XX TBD µg/L by 20XX Discharge Limit by 20XX</p> <p>TBD # toxic samples allowed by 20XX TBD # toxic samples allowed by 20XX Discharge Limit by 20XX</p> <p>TBD Toxicity Unit by 20XX TBD Toxicity Unit by 20XX Discharge Limit by 20XX</p> <p><i>Relatively shorter time schedule</i></p>

TABLE 3: PESTICIDE MANAGEMENT FOR SURFACE WATER AND GROUNDWATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
			<ul style="list-style-type: none"> - <i>Concentration</i>: No more than two (2) consecutive samples exceed the EPA Aquatic Life Benchmark or LC50, whichever is lower, for 2025 - <i>Toxic Unit</i>: Median of 4 consecutive samples < 1.0 TU for 2023 - <i>Toxic Unit</i>: Median of 3 consecutive samples < 1.0 TU for 2025 - Receiving water limit achieved for 2027 - Discharge Limit(s) triggered in 2027 if receiving water limit not achieved 	
<p>Monitoring and Reporting*</p>	<p><u>Annual Compliance Form</u> <i>All Tier 2 and Tier 3 ranches must submit information on the following.</i></p> <ul style="list-style-type: none"> a. Irrigation, stormwater, and tile drain discharge characteristics b. Pesticide management practices <p><u>Surface Water Quality Trends</u> <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p><u>Follow-Up Receiving Water Monitoring</u> Not required.</p> <p><u>Individual Discharge to Surface Water</u> <i>A subset of Tier 3 ranches must submit information on the following.</i></p> <ul style="list-style-type: none"> a. Discharge flow rate and volume b. Discharge pesticide concentration(s) c. Discharge toxicity 	<p><u>Pesticide Management Plan & Report</u> <i>All ranches must monitor the following. Reporting based on ranch phase.</i></p> <ul style="list-style-type: none"> a. Application characteristics b. Irrigation, stormwater, and tile drain discharge characteristics c. Pesticide management practices <p><u>Surface Water Quality Trends</u> <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p><u>Follow-Up Receiving Water Monitoring</u> <i>Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned follow-up surface receiving water quality monitoring, performed either individually or through a cooperative program.</i></p> <p><u>Individual Discharge to Surface Water</u> <i>Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned individual discharge monitoring.</i></p> <ul style="list-style-type: none"> a. Discharge flow rate and volume b. Discharge pesticide concentration(s) c. Discharge toxicity 	<p><u>Pesticide Management Plan & Report</u> <i>All ranches must monitor and report:</i></p> <ul style="list-style-type: none"> a. Application characteristics b. Irrigation, stormwater, and tile drain discharge characteristics c. Pesticide management practices <p><u>Surface Water Quality Trends</u> <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p><u>Follow-Up Receiving Water Monitoring</u> <i>Ranches in prioritized watershed areas that exceed receiving water objectives may be assigned follow-up surface receiving water quality monitoring, performed either individually or through a cooperative program.</i></p> <p><u>Individual Discharge to Surface Water</u> <i>Ranches in prioritized watershed areas that exceed the numeric limits per the time schedule may be assigned individual discharge monitoring.</i></p> <ul style="list-style-type: none"> a. Discharge flow rate and volume b. Discharge pesticide concentration(s) c. Discharge toxicity 	<p><u>Pesticide Management Plan & Report</u> <i>All ranches must monitor the following. Report submittal for all ranches concurrently.</i></p> <ul style="list-style-type: none"> a. Application characteristics b. Irrigation, stormwater, and tile drain discharge characteristics c. Pesticide management practices <p><u>Surface Water Quality Trends</u> <i>All ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program.</i></p> <p><u>Follow-Up Receiving Water Monitoring</u> <i>Ranches in all watershed areas that repeatedly exceed water quality objectives may be assigned follow-up surface receiving water quality monitoring, performed either individually or through a cooperative program.</i></p> <p><u>Individual Discharge to Surface Water</u> <i>Ranches in all watershed areas that repeatedly exceed water quality objectives must perform individual discharge monitoring.</i></p> <ul style="list-style-type: none"> a. Discharge flow rate and volume b. Discharge pesticide concentration(s) c. Discharge toxicity

TABLE 3: PESTICIDE MANAGEMENT FOR SURFACE WATER AND GROUNDWATER PROTECTION				
	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
	<p><u>Drinking Water Supply Well</u> Pesticide monitoring not required.</p>	<p><u>Drinking Water Supply Well</u> <i>A subset of drinking water supply wells</i> must be monitored for pesticides, either individually or through a cooperative program.</p> <p><i>Relatively more estimates are accepted in monitoring and reporting.</i></p>	<p><u>Drinking Water Supply Well</u> <i>A subset of wells</i> must be monitored for pesticides, either individually or through a cooperative program.</p>	<p><u>Drinking Water Supply Well</u> <i>All drinking water supply wells</i> must be monitored for pesticides, either individually or through a cooperative program.</p> <p><i>Relatively more measurements are required in monitoring and reporting.</i></p>
Incentives	Sustainability Certification	TBD	<ul style="list-style-type: none"> - Third-party sustainability certification may result in reduced monitoring and reporting - Third-party implementation program may result in reduced monitoring and reporting 	TBD
Definitions	<p>-TBD means "to be determined" and is used as a placeholder for the value of the numeric limits *Required elements; other elements are included because they can help improve the effectiveness of the Order and to solicit stakeholder input</p>			

TABLE 4: SEDIMENT AND EROSION MANAGEMENT FOR SURFACE WATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
Phasing or Prioritization	<u>Tiers</u> are based on ranch characteristics including ranch size, crops grown, specific chemical usage, proximity to impaired surface water, proximity to impaired public supply well.	<u>Phases</u> are based on location-specific conditions including water quality impairment, high quality surface water, and risk characteristics such as slope and impermeable surfaces.	<u>Prioritization</u> based on location-specific conditions related to nutrients (Table 2) and pesticide toxicity (Table 3). Additional requirements apply based on site conditions including impermeable surfaces during the rainy season and slope.	<u>No prioritization or phasing.</u> All requirements apply to all ranches concurrently.
Quantifiable Milestones* (Numeric Limits)	None	<p>Discharge Limits Turbidity = TBD NTU (COLD) Turbidity = TBD NTU (WARM)</p> <p>Cultivation on ranches with impermeable surfaces on slopes greater than TBD% is not covered by this order. Ranches may apply for individual waste discharge requirements.</p> <p>No discharge of sediment due to erosion events may occur.</p> <p>No discharge may cause or contribute to altering the receiving water channel through scour, bank failure, downcutting, or sediment accumulation.</p> <p>Stormwater discharge intensity and volume from ranches with impermeable surfaces may not exceed discharge intensity and volume from equivalent non-impermeable area for any storm up to and including the design storm. Design storm TBD.</p>	<p>Receiving Water Limits and Discharge Limits Turbidity = 25 NTU (COLD) Turbidity = 40 NTU (WARM)</p> <p>If cultivation occurs on ranches with impermeable surfaces during the winter months on slopes greater than 10% then the site must have a sediment and erosion control plan designed and approved by a qualified professional.</p> <p>No discharge of sediment due to slope failure events may occur at a rate or volume that may cause or contribute to exceedance of water quality objectives.</p> <p>No discharge may cause or contribute to altering the receiving water channel through scour, bank failure, downcutting, or sediment accumulation.</p> <p>Stormwater discharge intensity and/or volume from ranches with impermeable surfaces may not exceed discharge intensity and/or volume from equivalent non-impermeable area for any storm up to and including the design storm. <u>Design storm:</u> -Volume: 95th percentile, 24-hour storm -Intensity: 10-year storm</p>	<p>Discharge Limits Turbidity = TBD NTU (COLD) Turbidity = TBD NTU (WARM)</p> <p>Cultivation on ranches with impermeable surfaces on slopes greater than TBD% is not covered by this order. Ranches may apply for individual waste discharge requirements.</p> <p>No discharge of sediment due to erosion events may occur.</p> <p>No discharge may cause or contribute to altering the receiving water channel through scour, bank failure, downcutting, or sediment accumulation.</p> <p>No stormwater discharge may occur for any storm up to and including the design storm. Design storm TBD.</p> <p><u>Ranches that repeatedly exceed</u> the numeric discharge limits per the time schedule may be prohibited from discharging irrigation water.</p>

TABLE 4: SEDIMENT AND EROSION MANAGEMENT FOR SURFACE WATER PROTECTION				
	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
		<i>Relatively higher limits</i>	<i>If the receiving water is higher quality water than these limits, the higher quality receiving water shall be maintained, unless degradation is allowed through appropriate findings.</i>	<i>Relatively lower limits</i>
Time Schedule*	None	<p>Discharge Limit TBD NTU by 20XX (COLD & WARM) TBD NTU by 20XX (COLD & WARM) Discharge Limit by 20XX (COLD & WARM)</p> <p><i>Relatively longer time schedule</i></p>	<p>Receiving Water Limit and Discharge Limit <i>Example schedule for prioritized watershed:</i> -100 NTU for 2023 (COLD & WARM) -40 NTU for 2025 (COLD & WARM) -25 NTU for 2027 (COLD) -Receiving water limit achieved for 2027 -Discharge limit triggered in 2027 if receiving water limit not achieved</p>	<p>Discharge Limit TBD NTU by 20XX (COLD & WARM) TBD NTU by 20XX (COLD & WARM) Discharge Limit by 20XX (COLD & WARM)</p> <p><i>Relatively shorter time schedule</i></p>
Monitoring and Reporting*	<p>Annual Compliance Form <i>All Tier 2 and Tier 3 ranches must monitor and report the following.</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Sediment and erosion management practices c. Irrigation management practices</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality trend monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring Not required.</p>	<p>Sediment & Erosion Management Plan <i>All ranches must monitor the following. Report submittal based on phase.</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Sediment and erosion management practices c. Irrigation management practices d. Stormwater management practices e. Proper sizing, design, and maintenance of sediment and erosion control measures, e.g. sediment retention basins</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality trend monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring <i>Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned follow-up surface receiving water</i></p>	<p>Sediment & Erosion Management Plan <i>All ranches must monitor and report:</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Sediment and erosion management practices c. Irrigation management practices d. Stormwater management practices e. Proper sizing, design, and maintenance of sediment and erosion control measures, e.g. sediment retention basins f. Ranches with impermeable surfaces during winter on slope greater than 10% must have sediment & erosion management plan created by qualified professional.</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality trend monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring <i>Ranches in prioritized watershed areas that exceed receiving water objectives may be assigned follow-up surface receiving water</i></p>	<p>Sediment & Erosion Management Plan <i>All ranches must monitor the following. Report submittal for all ranches concurrently.</i></p> <p>a. Irrigation, stormwater, and tile drain discharge characteristics b. Sediment and erosion management practices c. Irrigation management practices d. Stormwater management practices e. Proper sizing, design, and maintenance of sediment and erosion control measures, e.g. sediment retention basins</p> <p>Surface Water Quality Trends <i>All ranches must conduct surface receiving water quality trend monitoring, either individually or through a cooperative program.</i></p> <p>Follow-Up Receiving Water Monitoring <i>Ranches in all watershed areas that repeatedly exceed water quality objectives may be assigned follow-up surface receiving water</i></p>

TABLE 4: SEDIMENT AND EROSION MANAGEMENT FOR SURFACE WATER PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 - Updated Option	Ag Order 4.0 (Conceptual Option 2)
	<p><u>Individual Discharge to Surface Water</u> <i>A subset of Tier 3 ranches must submit information on the following.</i></p> <p>a. Discharge flow rate and volume b. Discharge turbidity</p>	<p>quality monitoring, performed either individually or through a cooperative program.</p> <p><u>Individual Discharge to Surface Water</u> <i>Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned individual discharge monitoring.</i></p> <p>a. Discharge flow rate and volume b. Discharge turbidity</p> <p><i>Relatively more estimates are accepted in monitoring and reporting.</i></p>	<p>quality monitoring, performed either individually or through a cooperative program.</p> <p><u>Individual Discharge to Surface Water</u> <i>Ranches in prioritized watershed areas that exceed the numeric limits per the time schedule may be assigned individual discharge monitoring.</i></p> <p>a. Discharge flow rate and volume b. Discharge turbidity</p>	<p>quality monitoring, performed either individually or through a cooperative program.</p> <p><u>Individual Discharge to Surface Water</u> <i>Ranches in all watershed areas that repeatedly exceed water quality objectives must perform individual discharge monitoring.</i></p> <p>a. Discharge flow rate and volume b. Discharge turbidity</p> <p><i>Relatively more measurements are required in monitoring and reporting.</i></p>
Incentives	Sustainability Certification	TBD	<ul style="list-style-type: none"> - Third-party sustainability certification may result in reduced monitoring and reporting - Third-party implementation program may result in reduced monitoring and reporting 	TBD
Definitions	<p>-NTU: nephelometric turbidity unit -COLD: beneficial use designation for cold fresh water habitat; WARM: beneficial use designation for warm fresh water habitat -Design storm: the storm intensity and volume that management measures such as sediment retention basins are designed to accommodate -TBD means “to be determined” and is used as a placeholder for the value of the numeric limits -Impermeable surfaces include materials such as plastic mulch and hoop houses; here, impermeable surfaces do not refer to soils *Required elements; other elements are included because they can help improve the effectiveness of the Order and to solicit stakeholder input</p>			

TABLE 5: RIPARIAN HABITAT MANAGEMENT FOR WATER QUALITY PROTECTION

	Ag Order 3.0	Ag Order 4.0 (Conceptual Option 1)	Ag Order 4.0 – Updated Option	Ag Order 4.0 (Conceptual Option 2)																								
Phasing or Prioritization	<u>Tiers</u> are based on ranch characteristics including ranch size, crops grown, specific chemical usage, proximity to impaired surface water, proximity to impaired public supply well.	<u>Phases</u> are based on location-specific conditions including water quality impairment, high quality surface water, critical habitat, and beneficial use designations.	<u>Prioritization</u> based on location-specific conditions such as beneficial use impairment and high-quality waterbodies.	<u>No prioritization or phasing</u> . All requirements apply to all ranches concurrently.																								
Quantifiable Milestones* (Numeric Limits)	<p>Buffer Width <i>A subset of Tier 3 ranches must comply with the numeric limit.</i></p> <p>Buffer width = 30 feet OR Functional equivalent.</p>	<p>Setback Width and Native Vegetative Cover Ranch-level setback width and percent native vegetative cover requirements are based on stream classification system.</p> <p>Class X width = TBD feet Class X native grasses = TBD% Class X native shrubs = TBD% Class X native trees = TBD%</p> <p>OR Participate in an approved watershed restoration program.</p>	<p>Setback Width and Native Vegetative Cover <i>Individual Approach in priority areas</i> Ranch-level setback width and percent native vegetative cover requirements for priority waterbodies are based on stream classification system.</p> <table border="1"> <thead> <tr> <th>Strahler Class</th> <th>Minimum Setback Width</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>no setback requirement</td> </tr> <tr> <td>Class 2</td> <td>50 feet with grasses</td> </tr> <tr> <td>Class 3 and 4</td> <td>80 feet with shrubs and grasses</td> </tr> <tr> <td>Class 5</td> <td>150 feet with trees, shrubs, and grasses</td> </tr> <tr> <td>Class 6</td> <td>250 feet with diverse trees, shrubs, and grasses</td> </tr> <tr> <td>Lakes, estuaries, and wetlands</td> <td>250 feet with diverse trees, shrubs, and grasses</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Percent Slope</th> <th>Setback Width Adjustment</th> </tr> </thead> <tbody> <tr> <td>15 - 17%</td> <td>add 10 feet</td> </tr> <tr> <td>18 - 20%</td> <td>add 30 feet</td> </tr> <tr> <td>21 - 23%</td> <td>add 50 feet</td> </tr> <tr> <td>24 - 25%</td> <td>add 60 feet</td> </tr> </tbody> </table> <p><i>Cooperative Approach in priority areas</i> Participate in a Cooperative Watershed Restoration Program (as approved by Executive Officer) AND must have a vegetated setback 1.5 times the width of the waterbody on each side. A Cooperative Approach</p>	Strahler Class	Minimum Setback Width	Class 1	no setback requirement	Class 2	50 feet with grasses	Class 3 and 4	80 feet with shrubs and grasses	Class 5	150 feet with trees, shrubs, and grasses	Class 6	250 feet with diverse trees, shrubs, and grasses	Lakes, estuaries, and wetlands	250 feet with diverse trees, shrubs, and grasses	Percent Slope	Setback Width Adjustment	15 - 17%	add 10 feet	18 - 20%	add 30 feet	21 - 23%	add 50 feet	24 - 25%	add 60 feet	<p>Setback Width and Native Vegetative Cover Setback width and percent native vegetative cover requirements for each ranch are based on functional riparian assessment (e.g. pHab/ RipRAM).</p>
Strahler Class	Minimum Setback Width																											
Class 1	no setback requirement																											
Class 2	50 feet with grasses																											
Class 3 and 4	80 feet with shrubs and grasses																											
Class 5	150 feet with trees, shrubs, and grasses																											
Class 6	250 feet with diverse trees, shrubs, and grasses																											
Lakes, estuaries, and wetlands	250 feet with diverse trees, shrubs, and grasses																											
Percent Slope	Setback Width Adjustment																											
15 - 17%	add 10 feet																											
18 - 20%	add 30 feet																											
21 - 23%	add 50 feet																											
24 - 25%	add 60 feet																											

	<p>Prohibition The removal of existing riparian vegetative cover is prohibited, unless authorized through another permitting mechanism</p>	<p>Prohibition The removal of existing native riparian vegetative cover is prohibited, unless authorized through another permitting mechanism.</p>	<p>program may not be approved in certain watersheds if it will result in degradation. Restoration acreage is based upon the setback acreage that would have been required on the farm under the Individual Approach, at the following mitigation ratios:</p> <table border="1" data-bbox="1464 378 2002 560"> <thead> <tr> <th>Waterbody Type</th> <th>Ratio</th> </tr> </thead> <tbody> <tr> <td>Lakes, estuaries, and wetlands</td> <td>4:1</td> </tr> <tr> <td>Perennial waterbodies or springs</td> <td>3:1</td> </tr> <tr> <td>Intermittent waterbodies</td> <td>2:1</td> </tr> <tr> <td>Canals and water supply reservoirs</td> <td>1:1</td> </tr> </tbody> </table> <p><i>All other non-priority waterbodies and ranches participating in Cooperative Approach</i> All dischargers with a Class 2 or higher waterbody on or adjacent to their ranch must have a vegetated setback for erosion control that is 1.5 times the width of the waterbody on each side. The presence of bare soil vulnerable to erosion is prohibited for all waterbody classes. No non-native invasive species may be planted within setbacks.</p> <p>Prohibition The removal of existing native riparian vegetative cover is prohibited, unless authorized through another permitting mechanism.</p>	Waterbody Type	Ratio	Lakes, estuaries, and wetlands	4:1	Perennial waterbodies or springs	3:1	Intermittent waterbodies	2:1	Canals and water supply reservoirs	1:1	<p>Prohibition The removal of existing native riparian vegetative cover is prohibited, unless authorized through another permitting mechanism.</p>
Waterbody Type	Ratio													
Lakes, estuaries, and wetlands	4:1													
Perennial waterbodies or springs	3:1													
Intermittent waterbodies	2:1													
Canals and water supply reservoirs	1:1													
<p>Time Schedule*</p>	<p>None</p>	<p>Setback Width Establishment Phase 1 by 20XX Phase 2 by 20XX <i>etc.</i></p> <p>Native Vegetative Cover Establishment Phase 1 by 20XX Phase 2 by 20XX <i>etc.</i></p>	<p>Setback Width Establishment Setback width establishment date to be determined based on priority areas.</p> <p>Native Vegetative Cover Establishment Native vegetative cover establishment date to be determined based on priority areas.</p>	<p>Setback Width Establishment All ranches by 20XX</p> <p>Native Vegetative Cover Establishment All ranches by 20XX</p>										

<p>Monitoring and Reporting*</p>	<p><u>Water Quality Buffer Plan</u> <i>A subset of Tier 3 ranches must develop a Water Quality Buffer Plan and report on the following.</i></p> <ol style="list-style-type: none"> Buffer width, in feet Total vegetative cover, in percent Vegetative cover by type, in percent (trees, shrubs, grasses, non-vegetated) Vegetative shading of active water channel, in percent Photo-monitoring of current average riparian condition <p><u>Individual Riparian Assessment</u> Not required.</p> <p><u>Surface Water Quality Trends</u> <i>All ranches</i> must conduct regional bioassessment trend monitoring, either individually or through a cooperative program.</p>	<p><u>Riparian Management Reporting</u> <i>Based on phase, all ranches adjacent to surface waterbodies must monitor and report the following.</i></p> <ol style="list-style-type: none"> Buffer width, in feet Total native vegetative cover, in percent Vegetative cover by type, in percent (trees, shrubs, grasses, non-vegetated) Digital map of farm and setback boundaries <p><u>Individual Riparian Assessment</u> Not required.</p> <p><u>Surface Water Quality Trends</u> <i>All ranches</i> must conduct regional bioassessment trend monitoring, either individually or through a cooperative program.</p> <p><i>Relatively more estimates are accepted in monitoring and reporting.</i></p>	<p><u>Riparian Management Reporting</u></p> <p><u>Individual Approach</u></p> <ol style="list-style-type: none"> Buffer width, in feet Total native vegetative cover, in percent Vegetative cover by type, in percent (trees, shrubs, grasses, non-vegetated) Digital map of farm and setback boundaries <p><u>Cooperative Approach</u> Cooperative program monitors and reports progress annually.</p> <p><u>Surface Water Quality Trends</u> <i>All ranches</i> must conduct regional bioassessment trend monitoring, either individually or through a cooperative program.</p>	<p><u>Riparian Management Reporting</u> <i>Concurrently, all ranches adjacent to surface waterbodies must monitor and report the following.</i></p> <ol style="list-style-type: none"> Buffer width, in feet Total native vegetative cover, in percent Vegetative cover by type, in percent (trees, shrubs, grasses, non-vegetated) Digital map of farm and setback boundaries <p><u>Individual Riparian Assessment</u> <i>All ranches</i> adjacent to surface waterbodies must score the functional riparian setback annually using a method (e.g., pHab/RipRAM).</p> <p><u>Surface Water Quality Trends</u> <i>All ranches</i> must conduct regional bioassessment trend monitoring, either individually or through a cooperative program.</p> <p><i>Relatively more measurements are required in monitoring and reporting.</i></p>
	<p>Incentives</p>	<p>Sustainability Certification</p>	<p>TBD</p>	<p>-Cooperative Approach may allow for reduced setback and vegetation requirements within the ranch</p>
<p>Definitions</p>	<p><i>-Riparian is defined as vegetation, habitat, or ecosystems that are associated with bodies of water (creeks, streams, or lakes) or are dependent on the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage</i></p> <p><i>-Riparian areas include those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., a zone of influence)</i></p> <p><i>-pHab is an index of physical habitat condition incorporating channel morphology, flow, patch types, substrate, riparian complexity, and energy</i></p> <p><i>-RipRAM is a rapid riparian assessment method designed to score the overall health of a riparian area</i></p> <p><i>-TBD means "to be determined" and is used as a placeholder for the value of the numeric limits</i></p> <p>*Required elements; other elements are included because they can help improve the effectiveness of the Order and to solicit stakeholder input</p>			