

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

ORDER NO. R5-2014-0032

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
SACRAMENTO VALLEY RICE GROWERS**

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March 2014

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

Findings

SCOPE AND COVERAGE OF THIS ORDER

1. This Order serves as general waste discharge requirements (WDRs) for waste discharges from irrigated lands (or “discharges”) that could affect ground and/or surface waters of the state. The discharges result from runoff or leaching of irrigation water and/or stormwater from irrigated lands. Discharges can reach waters of the state directly or indirectly.¹
2. This Order applies to producers of commercial rice² operating on fields within the Sacramento Valley³ that are rice producers, as defined in the California Food and Agricultural Code section 71032. By extension this order also applies to landowners that lease, rent or otherwise own land that is used by a producer of rice (hereafter collectively referred to as “Growers”).⁴ The California Rice Commission (defined in California Food and Agricultural (Food & Ag) Code, Chapter 9.5, Division 22) is recognized as the third party representing Growers under this Order.
3. This Order is not intended to regulate water quality as it travels through or remains on the surface of a Grower’s agricultural fields or the water quality of soil pore liquid within the root zone.⁵
4. This Order does not apply to discharges of waste that are regulated under other Central Valley Water Board issued WDRs or conditional waiver of WDRs (waiver). If the other Central Valley Water Board WDRs/waiver only regulates some of the waste discharge activities (e.g., application of treated wastewater to crop land) at the regulated site, the owner/operator of the

¹ Definitions for “waste discharges from irrigated lands,” “waste,” “groundwater,” “surface water,” “stormwater runoff,” and “irrigation runoff,” as well as all other definitions, can be found in Attachment E to this Order. It is important to note that irrigation water, the act of irrigating cropland, and the discharge of irrigation water unto itself is not “waste” as defined by the California Water Code, but that irrigation water may contain constituents that are considered to be a “waste” as defined by California Water Code section 13050(d).

² Rice is defined as the species *Oryza sativa*. The Order applies to Growers of seed rice. Growers of wild rice (genus *Zizania*) are not covered by this Order.

³ This Order applies to counties in the Sacramento Valley where rice is grown: Butte, Colusa, Glenn, Placer, Sacramento, Sutter, Tehama, Yolo, and Yuba.

⁴ Grower(s) is defined to mean a producer of rice as defined in California Food and Agriculture Code, section 71032, or a landowner that leases, rents, or otherwise owns land that is used by a producer of rice. For both producers of rice and landowners, the land in question must be located within the Sacramento Valley, which includes the counties of Sacramento, Sutter, Yuba, Butte, Glenn, Colusa, Yolo, Placer, and Tehama.

⁵ Water that travels through or remains on the surface of a grower’s agricultural fields includes ditches and other structures (e.g., ponds, basins) that are used to convey supply or drainage water within that grower’s parcel or between contiguous parcels owned or operated by that grower.

irrigated lands must obtain regulatory coverage for any discharges of waste that are not regulated by the other WDR/waiver. Such regulatory coverage may be sought through enrollment in the Irrigated Lands Regulatory Program (ILRP) through another third-party entity or by obtaining appropriate changes in the owner/operator's existing WDRs or waiver.

5. This Order implements the long-term Irrigated Lands Regulatory Program (ILRP) for rice lands in the Sacramento Valley. The long-term ILRP has been conceived as a range of potential alternatives and evaluated in a programmatic environmental impact report (PEIR).⁶ The PEIR was certified by the Central Valley Water Board on 7 April 2011; however, the PEIR did not specify a single program alternative. The regulatory requirements contained within this Order fall within the range of alternatives evaluated in the PEIR. This Order, along with other orders to be adopted for irrigated lands within the Central Valley, will constitute the long-term ILRP. Upon adoption of this Order, Order No R5-2006-0053, Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Coalition Group Conditional Waiver) is rescinded as applied to rice lands within the Sacramento Valley.

GROWERS REGULATED UNDER THIS ORDER

6. In 2010, an estimated 565,000 acres of rice was reported by the County Agricultural Commissioners to the California Rice Commission. About 90% of the rice grown in California is medium grain rice and 95% of rice is grown within the Sacramento Valley in nine counties.⁷
7. This Order regulates both landowners and operators of rice lands from which there are discharges of waste that could affect the quality of any waters of the state and who are producers⁸ represented by the California Rice Commission, and by extension landowners that lease, rent or otherwise own land that is used by a producer of rice. The California Rice Commission is acting as a third-party group representing and assisting Growers with carrying out the conditions of this Order. The provisions of this Order require that a producer who is not the landowner must provide notification to the landowner of this Order and its conditions. Both the landowner and producer are ultimately responsible for complying with the terms and conditions of this Order.
8. All Growers eligible for coverage under this Order are represented by the California Rice Commission.⁹ The Food & Ag Code outlines the California Rice Commission organizational structure that includes a governing board with producers and handlers¹⁰ (defined as "members") and lists the authority and responsibilities of the commission. The California Rice Commission served as a third-party group representing Growers during the interim irrigated lands regulatory program (Coalition Group Conditional Waiver) and is recognized as having the structure and authority necessary to act as the third-party representing Growers under this Order for the following reasons:

⁶ ICF International. 2011. *Irrigated Lands Regulatory Program, Program Environmental Impact Report*. Final and Draft. March. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA

⁷ Nine Sacramento Valley counties – Butte, Colusa, Glenn, Placer, Sacramento, Sutter, Tehama, Yolo and Yuba – harvested 97% of all rice reported in 2009 by County Agricultural Commissioners.

⁸ Defined in Food & Agricultural Code, §71032 as any person who produces, or causes to be produced rice.

⁹ Rice lands outside of the Sacramento Valley are not covered under this Order.

¹⁰ A handler is any person marketing rice who handles 10,000,000 pounds or more of rough or paddy rice, or the equivalent amount of milled rice during a marketing season.

- The California Rice Commission has represented Growers in implementing the Coalition Group Conditional Waiver. In this role, the California Rice Commission has developed and implemented regional surface water monitoring programs; conducted Grower outreach; and implemented surface water quality management plans to address exceedances of water quality standards. The commission has demonstrated that it has the resources and authority to act on behalf of Growers in accessing technical resources, such as expert consultants, to assist in implementing the requirements of the Coalition Group Conditional Waiver. Under this Order, the commission will continue to implement outreach programs, surface water quality monitoring, surface water management plans and begin initiation of groundwater monitoring and management requirements where appropriate. Food & Ag Code section 71079 states, "The commission may present facts to, and negotiate with, local, state, federal, and foreign agencies on matters that affect the rice industry." The commission is a legally defined entity with a governing board (members) composed of producers (rice growers) and handlers. The governing board is accountable to producers and handlers through a voting process outlined in Food & Ag Code section 71050.
 - Section 71086 of the Food & Ag Code provides that the California Rice Commission shall establish an assessment rate to defray operating costs of the commission.
 - Section 71078 of the Food & Ag Code requires that the commission provide summary information on annual audits of "books, records, and accounts of all its dealings." Currently, the commission provides this information on their website, accessible to producers and handlers.
9. This Order regulates all Growers within the Sacramento Valley. Under this Order, the California Rice Commission will be required to identify the location of rice fields covered by this Order, but shall not be required to disclose information considered confidential under Food & Ag Code section 71089. From this information, the Board will be able to determine assessor's parcel numbers (APNs) and individual Growers covered under this Order. These waste discharge requirements only apply to discharges from commercial rice fields in the Sacramento Valley. Should a rice field be converted to another commercial crop that is irrigated or if rice is rotated with another crop on that field, the Grower must submit a Report of Waste Discharge to the Central Valley Water Board or obtain coverage for the waste discharge under another ILRP general Order or waiver.
10. The California Rice Commission is responsible for fulfilling the regional requirements and conditions (e.g., surface water and groundwater monitoring, regional management plan development and tracking) of this Order and associated Monitoring and Reporting Program Order R5-2014-0032 (MRP). As rice producers under Food & Ag Code section 71032, Growers in the Sacramento Valley have agreed to be represented by the California Rice Commission for the purposes of the Order. All Growers represented by the California Rice Commission will be enrolled under this Order upon adoption by the Central Valley Water Board. All Growers must certify that they are aware of the requirements of this Order when completing a rice-specific Farm Evaluation (see section VII.B of this Order). Any requirements or conditions not fulfilled by the California Rice Commission are the responsibility of the individual Grower. The Growers are responsible for conduct of operations on the Grower's enrolled property.

REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

11. The Central Valley Region has approximately 565,000 acres of rice land in the Sacramento Valley potentially generating discharges that fall into the category of “waste discharges from irrigated lands,” as defined in Attachment E of this Order.
12. The Sacramento Valley has numerous surface water bodies that may be affected by discharges of waste from rice lands. These discharges may adversely affect the quality of the waters of the State, as defined in Attachment E of this Order.
13. The Central Valley Water Board’s *Irrigated Lands Regulatory Program Existing Conditions Report* (ECR)¹¹ identifies waters of the State with impaired water quality attributable to or influenced by irrigated agriculture, including rice lands. The *Irrigated Lands Program Environmental Impact Report* (PEIR) describes that “[f]rom a programmatic standpoint, irrigated land waste discharges have the potential to cause degradation of surface and groundwater...”
14. The Central Valley Water Board authority to regulate discharges of waste that could affect the quality of the waters of the state, which includes both surface water and groundwater, is found in the Porter-Cologne Water Quality Control Act (California Water Code Division 7).
15. California Water Code section 13263 requires the Central Valley Water Board to prescribe WDRs, or waive WDRs, for proposed, existing, or material changes in discharges of waste that could affect water quality. The board may prescribe waste discharge requirements although no discharge report under California Water Code section 13260 has been filed. The WDRs must implement relevant water quality control plans and the California Water Code. The Central Valley Water Board may prescribe general waste discharge requirements for a category of discharges if all the following criteria apply to the discharges in that category:
 - a. The discharges are produced by the same or similar operations.
 - b. The discharges involve the same or similar types of waste.
 - c. The discharges require the same or similar treatment standards.
 - d. The discharges are more appropriately regulated under general requirements than individual requirements.

The rationale for developing general waste discharge requirements for rice lands in the Sacramento Valley include: (a) discharges are produced by the same type of operations (rice farming operations); (b) waste discharges under this Order involve similar types of wastes (wastes associated with rice farming); (c) water quality management practices are similar for rice lands; (d) due to the large number of operations and their contiguous location, these types of operations are more appropriately regulated under general rather than individual requirements; and (e) the soil, aquifer materials, hydrology, and the climate are similar, which will tend to result in similar types of water quality problems¹² and similar types of solutions.

16. Whether an individual discharge of waste from rice lands may affect the quality of the waters of the state depends on the quantity of the discharge, quantity of the waste, the quality of the waste, the extent of treatment, soil characteristics, distance to surface water, depth to groundwater, management practices and other site-specific factors. These individual discharges may also have a cumulative effect on waters of the state. Waste discharges from

¹¹ California Regional Water Quality Control Board, Central Valley Region, and Jones and Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report*. Sacramento, CA.

¹² “Water quality problem” is defined in Attachment E.

some rice lands may have impaired or degraded and may continue to impair or degrade the quality of the waters of the state within the Central Valley Region if not subject to regulation pursuant to the Porter-Cologne Water Quality Control Act (codified in Water Code Division 7).

17. California Water Code section 13267(b)(1) states: *“(1) In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. (2) When requested by the person furnishing a report, the portions of a report that might disclose trade secrets or secrete processes may not be made available for inspection by the public but shall be made available to governmental agencies for use in making studies. However, these portions of a report shall be available for use by the state or any state agency in judicial review or enforcement proceedings involving the person furnishing the report.”*
18. Technical reports are necessary to evaluate Grower compliance with the terms and conditions of this Order and to assure protection of waters of the State. Consistent with California Water Code section 13267, this Order requires the implementation of a monitoring and reporting program (MRP) that is intended to determine the effects of Grower waste discharges on water quality, to verify the adequacy and effectiveness of the Order’s conditions, and to evaluate Grower compliance with the terms and conditions of the Order. The requirements for reports and monitoring specified in this Order and attached MRP are based in part on whether an operation is within a high or low vulnerability area. The California Rice Commission is tasked with describing high and low vulnerability areas based on definitions provided in Attachment E to this Order and guidance provided in the MRP. The Executive Officer will review California Rice Commission proposed high and low vulnerability areas and make the final determination of these areas. High and low vulnerability areas will be reviewed and updated throughout the implementation of this Order. Based on currently available information, there are no high vulnerability areas for groundwater or surface water due to discharges from rice lands. A Grower who is covered under this Order must comply with MRP Order R5-2014-0032 which is part of this Order, and future revisions thereto by Executive Officer or board.
19. Prior to the adoption of this Order, the California Rice Commission prepared a Rice-Specific Groundwater Assessment Report (Rice GAR), which was submitted to the Central Valley Water Board in April 2012. The Rice GAR has been subsequently revised (Final– Rice-Specific Groundwater Assessment Report, 2 August 2013) and satisfies the requirements of a Groundwater Quality Assessment Report as identified in this Order. Any modifications to the Rice GAR must be submitted to the Executive Officer for approval.
20. The water quality monitoring under this Order is representative in nature and does not measure individual field discharges. The benefits of representative monitoring include the ability to determine whether water bodies accepting discharges from numerous rice lands are meeting water quality objectives, and to determine if existing high quality waters are being maintained. Further, representative monitoring allows the board to determine whether represented practices

are protective of water quality. There are cost savings with representative monitoring, since all surface water or all groundwater aquifers that receive discharges from rice lands do not need to be monitored. Surface water and groundwater monitoring sites are selected to represent areas with similar conditions (e.g., soil type).

If triggered, the Management Practices Evaluation Program, the Surface Water Quality Management Plans, and Groundwater Quality Management Plans, require the California Rice Commission to evaluate the effectiveness of management practices in addressing an identified water quality. In addition, Growers must report the practices they are implementing to protect water quality.

Where required monitoring and evaluation do not allow the Central Valley Water Board to determine potential sources of water quality problems or identify whether management practices are effective, the Executive Officer may require the California Rice Commission or individual Growers to provide technical reports. Such technical reports are needed when monitoring or other available information is not sufficient to determine the effects of waste discharges from rice lands to waters of the state. It may also be necessary for the Central Valley Water Board to conduct investigations by obtaining information directly from Growers to assess individual compliance.

The Board recognizes that representative monitoring data in and of itself will not allow the Board to determine the specific source or sources of water quality problems; however, subsequent actions, assessments and reporting required from the California Rice Commission will provide the information necessary for the identification of the source(s) and causes of the water quality problem, the identification of actions implemented by Growers to ensure water quality is protected, and the reporting of water quality data to demonstrate the water quality problem has been resolved. Therefore, representative monitoring in conjunction with other requirements in this Order and the board's compliance and enforcement activities will also allow the board to determine whether Growers are complying with this Order.

21. The Central Valley Water Board's *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains programs of implementation needed to achieve water quality objectives, and references the plans and policies adopted by the State Water Board. The water quality objectives are developed to protect the beneficial uses of waters of the state. Compliance with water quality objectives will protect the beneficial uses listed in Findings 23 and 24.
22. This Order implements the Basin Plan and applicable State policies by requiring the implementation of management practices that are considered to constitute best practicable treatment or control, where applicable, that achieve compliance with applicable water quality objectives and that prevent nuisance. The Order requires implementation of a monitoring and reporting program to determine effects of rice discharges on water quality and the effectiveness of management practices designed to comply with applicable water quality objectives.
23. Pursuant to the Basin Plan and State Water Board plans and policies, including State Water Board Resolution 88-63, and consistent with the federal Clean Water Act, the existing and potential beneficial uses of surface waters in the Sacramento Valley include:
 - a. Municipal and Domestic Supply
 - b. Agricultural Supply

- c. Industrial Service Supply
 - d. Hydropower Generation
 - e. Water Contact Recreation
 - f. Non-Contact Water Recreation
 - g. Warm Freshwater Habitat
 - h. Cold Freshwater Habitat
 - i. Migration of Aquatic Organisms
 - j. Spawning, Reproduction and Development
 - k. Wildlife Habitat
 - l. Estuarine Habitat
 - m. Preservation of Biological Habitats of Special Significance
 - n. Shellfish Harvesting
 - o. Navigation
 - p. Rare, Threatened, and Endangered Species
 - q. Freshwater Replenishment
 - r. Groundwater Recharge
 - s. Industrial Process Supply
 - t. Aquaculture
 - u. Commercial and Sportfishing
24. Pursuant to the Basin Plan and State Water Board plans and policies, including State Water Board Resolution 88-63, all ground waters in the region are considered as suitable or potentially suitable at a minimum, for:
- a. Municipal and Domestic Supply
 - b. Agricultural Supply
 - c. Industrial Service Supply
 - d. Industrial Process Supply
25. In May 2004, the State Water Board adopted the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy). The purpose of the NPS Policy is to improve the State's ability to effectively manage NPS pollution and conform to the requirements of the Federal Clean Water Act and the Federal Coastal Zone Act Reauthorization Amendments of 1990. The NPS Policy requires, among other key elements, an NPS control implementation program's ultimate purpose shall be explicitly stated. It also requires implementation programs to, at a minimum, address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.
26. This Order constitutes an NPS Implementation Program for the discharges regulated by the Order. The ultimate purpose of this program is expressly stated in the goals and objectives for the ILRP, described in the PEIR and Attachment A to this Order. Attachment A, Information Sheet, describes the five key elements required by the NPS Policy and provides justification that the requirements of this Order meet the requirements of the NPS Policy. This Order is consistent with the NPS Policy.
27. The United States Environmental Protection Agency adopted the National Toxics Rule (NTR) on 5 February 1993 and the California Toxics Rule (CTR) on 18 May 2000, which was modified on 13 February 2001. The NTR and CTR contain water quality criteria which, when combined with beneficial use designations in the Basin Plan, constitute enforceable water quality standards for priority toxic pollutants in California surface waters.

28. It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This order promotes that policy by, among other things, utilizing a tiered system that imposes more stringent requirements in areas deemed “high vulnerability” based on threat to surface water or groundwater quality, requiring surface water and groundwater monitoring and management plans, an identification and evaluation of management practices that are protective of surface water and groundwater quality, and requiring discharges to meet applicable water quality objectives, which include maximum contaminant levels designed to protect human health and ensure that water is safe for domestic uses. Protection of the beneficial uses of surface water and groundwater is described throughout this Order, including the discussion in Attachment A to this Order of State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality Waters in California*.

.CALIFORNIA ENVIRONMENTAL QUALITY ACT

29. For purposes of adoption of this Order, the Central Valley Water Board is the lead agency pursuant to CEQA (Public Resources Code sections 21100 et seq.). Pursuant to board direction in Resolutions R5-2006-0053 and R5-2006-0054, a Program Environmental Impact Report (PEIR) was prepared. In accordance with CEQA, the Central Valley Water Board, acting as the lead agency adopted Resolution R5-2011-0017 on 7 April 2011, certifying the PEIR for the Irrigated Lands Regulatory Program.
30. This Order relies on the environmental impact analysis contained in the PEIR to satisfy the requirements of CEQA. Although the Order is not identical to any of the PEIR alternatives, the Order is comprised entirely of elements of the PEIR’s wide range of alternatives. Therefore, the PEIR identified, disclosed, and analyzed the potential environmental impacts of the Order. The potential compliance activities undertaken by the Growers in response to this Order fall within the range of compliance activities identified and analyzed in the PEIR. Therefore, all potentially adverse environmental impacts of this Order have been identified, disclosed, and analyzed in the PEIR. If it is determined that a grower filing for coverage under this Order could create impacts not identified in the PEIR, individual WDRs would be prepared for that grower and additional CEQA analysis performed, which would likely tier off the PEIR as necessary. (See Title 14, CCR § 15152).
31. The requirements of this Order are based on elements of Alternatives 2 through 6 of the PEIR. The PEIR concludes that implementation of some of these elements has the potential to cause significant adverse environmental impacts. Such impacts are associated, directly and indirectly, with specific compliance activities Growers may conduct in response to the Order’s regulatory requirements. Such activities may include implementation of water quality management practices and monitoring well installation and operation. Attachment D of this Order describes the types of water quality management practices that may be implemented as a result of this Order and that monitoring wells may be installed as a result of this Order. The types and degrees of implementation will be similar to those described in the PEIR for Alternatives 2 through 6. Because of these similarities, this Order relies on the PEIR for its CEQA analysis. A listing of potential environmental impacts, the written findings regarding those impacts consistent with § 15091 of the CEQA Guidelines, and the explanation for each finding are contained in a separate Findings of Fact and Statement of Overriding Considerations document (Attachment D), which is incorporated by reference into this Order.

32. Where potentially significant environmental impacts identified in Attachment D may occur as a result of Growers' compliance activities, this Order requires that Growers either avoid the impacts where feasible or implement identified mitigation measures, if any, to reduce the potential impacts to a less than significant level. Where avoidance or implementation of identified mitigation is not feasible, use of this Order is prohibited and individual WDRs would be required. The Monitoring and Reporting Program (MRP) Order, Attachment B, includes a Mitigation Monitoring and Reporting Program to track the implementation of mitigation measures.
33. The PEIR finds that none of the program alternatives will cause significant adverse impacts to water quality. Consistent with alternatives in the PEIR, this Order contains measures needed to achieve and maintain water quality objectives and beneficial uses, reduce current pollutant loading rates, and minimize further degradation of water quality. As such, this Order will not cause significant adverse impacts to water quality.

STATE WATER RESOURCES CONTROL BOARD RESOLUTION 68-16

34. State Water Resources Control Board (State Water Board) Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16 or "antidegradation policy") requires that a Regional Water Quality Control Board maintain high quality waters of the state unless the board determines that any authorized degradation is consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in a Regional Water Quality Control Board's policies (e.g., quality that exceeds applicable water quality objectives). The board must also assure that any activity which discharges a waste to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure that pollution, or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the state will be maintained.
35. The Central Valley Water Board has information in its records that has been collected by the Central Valley Water Board, growers, educational institutions, and others that demonstrates that many water bodies within the Central Valley Region are impaired for various constituents, including pesticides, nitrates, and salts. Many water bodies have been listed as impaired pursuant to Clean Water Act section 303(d).

Appendix A to the PEIR for the Irrigated Lands Program states that "*there may be cases where irrigated agricultural waste discharges threaten to degrade high quality waters.*" For discharges to water bodies that are high quality waters, this Order is consistent with Resolution 68-16. Attachment A to this Order summarizes applicable antidegradation requirements and provides detailed rationale demonstrating how this Order is consistent with Resolution 68-16. As indicated in the summary, this Order authorizes degradation of high quality waters, not to exceed water quality objectives, threaten beneficial uses, or cause a condition of pollution or nuisance. The Order will also result in the implementation of BPTC by those discharging to high quality waters and assure that any change in water quality will be consistent with maximum benefit to the people of the state.

As authorized by Water Code section 13263(c), achievement of these requirements is in accordance with the Order's time schedules. Time schedules are necessary because not all growers covered by the Order can immediately comply with the Order's requirements. Using time schedules to implement antidegradation requirements was explicitly recognized and

endorsed by the California Court of Appeal, who wrote with respect to the Central Valley Water Board's Dairy Waste Discharge Requirements that "[a] phased approach... is reasonable, and is authorized by section 13263, which allows the requirements of a regional water quality control board to contain a time schedule." *AGUA v. Central Valley Water Board*, 210 Cal.App.4th 1255, 1277.

CALIFORNIA WATER CODE SECTIONS 13141 AND 13241

36. California Water Code section 13141 states that "*prior to implementation of any agricultural water quality control program, an estimate of the total cost of such a program, together with an identification of potential sources of financing, shall be indicated in any regional water quality control plan.*" Section 13141 concerns approvals or revisions to a water quality control plan and does not necessarily apply in a context where an agricultural water quality control program is being developed through waivers and waste discharge requirements rather than basin planning. However, the Basin Plan includes an estimate of potential costs and sources of financing for the long-term irrigated lands program. The estimated costs were derived by analyzing the six alternatives evaluated in the PEIR. This Order, which implements the long-term ILRP for Sacramento Valley rice Growers, is based on Alternatives 2-6 of the PEIR; therefore, estimated costs of this Order fall within the Basin Plan cost range.¹³ The total annual average cost of compliance with this Order, e.g., summation of costs for administration, monitoring, reporting, tracking, implementation of management practices, is expected to be approximately \$4.03 per acre greater than the current surface water only protection program under the Coalition Group Conditional Waiver. The total estimated average cost of compliance of continuation of the previous Coalition Group Conditional Waiver for Sacramento Valley rice Growers is expected to be approximately 2.13 million dollars per year (\$4.06 per acre annually). The total average estimated cost of compliance with this Order is expected to be approximately 4.25 million dollars per year (\$8.09 per acre annually).

Approximately \$4.59 of the estimated \$8.09 per acre annual cost of the Order is associated with implementation of management practices. This Order does not require that Growers implement specific water quality management practices.¹⁴ Many of the management practices that have water quality benefits can have other economic and environmental benefits. Management practice selection will be based on decisions by individual Growers in consideration of the unique conditions of their operation; water quality concerns; and other benefits expected from implementation of the practice. As such, the cost estimate is an estimate of potential, not required costs of implementing specific practices. Any costs for water quality management practices will be based on a market transaction between Growers and those vendors or individuals providing services or equipment and not based on an estimate of those costs provided by the board. The cost estimates include estimated fees the CRC may charge to prepare the required reports and conduct the required monitoring, as well as annual permit fees that are charged to permitted dischargers for permit coverage. In accordance with the State Water Board's Fee Regulations, the current annual permit fee charged to Growers covered by this Order is \$0.75/acre. The combined total estimated average costs that include CRC and state fees are estimated to be \$2.80/acre annually. These costs have been estimated using the same study used to develop the Basin Plan cost estimate, which applies to the whole ILRP. The basis for these estimates is provided in the *Draft Technical Memorandum Concerning the*

¹³ When compared on a per irrigated acre basis; as the Basin Plan cost range is an estimate for all irrigated lands in the Central Valley versus this Order's applicability to a portion thereof (rice lands in Sacramento Valley).

¹⁴ Per California Water Code section 13360, the Central Valley Water Board may not specify the manner in which a Grower complies with water quality requirements.

*Economic Analysis of the Irrigated Lands Regulatory Program.*¹⁵ Attachment A includes further discussion regarding the cost estimate for this Order.

37. California Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.
- (a) Past, present, and probable future beneficial uses of water.
 - (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
 - (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
 - (d) Economic considerations.
 - (e) The need for developing housing within the region.
 - (f) The need to develop and use recycled water.

These factors have been considered in the development of this Order. Attachment A, Information Sheet, provides further discussion on the consideration of section 13241 factors.

RELATIONSHIP TO OTHER ONGOING WATER QUALITY EFFORTS

38. Other water quality efforts conducted pursuant to state and federal law directly or indirectly serve to reduce waste discharges from irrigated lands to waters of the state. Those efforts will continue, and will be supported by implementation of this Order.
39. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten the achievement of water quality objectives in Central Valley surface water and groundwater. This Order requires actions that will reduce nitrate discharges and should result in practices that reduce salt loading. The board intends to coordinate all such actions with the CV-SALTS initiative. CV-SALTS may identify additional actions that need to be taken by irrigated agriculture and others to address these constituents. This Order can be amended in the future to implement any policies or requirements established by the Central Valley Water Board resulting from the CV-SALTS process. This Order includes provisions to promote coordination with CV-SALTS and to support the development of information needed for the CV-SALTS process.
40. Total Maximum Daily Loads (TMDLs) are established for surface waters that have been placed on the State Water Board's 303(d) list of Water Quality Limited Segments for failure to meet applicable water quality standards. A TMDL, which may be adopted by the Central Valley Water Board as a Basin Plan amendment, is the sum of allowable loads of a single pollutant from all contributing point sources and nonpoint sources. The Central Valley Water Board is currently developing a pesticide TMDL and organochlorine pesticide TMDL, among other TMDLs in development. This Order will implement these and other future applicable TMDLs to the extent there are established requirements that pertain to rice lands.

¹⁵ ICF International. 2010. *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program*. Draft. July. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA

COORDINATION AND COOPERATION WITH OTHER AGENCIES

41. *Integrated Regional Water Management Plans*: Pursuant to part 2.75 of Division 6 of the California Water Code (commencing with section 10750), local agencies are authorized to adopt and implement groundwater management plans (hereinafter "local groundwater management plans"), including integrated regional water management plans. The legislation provides recommended components to the plans such as control of saline water intrusion, regulation of the migration of contaminated water, monitoring of groundwater levels and storage, and the development of relationships with regulatory agencies. The information collected through implementation of groundwater management plans can support or supplement efforts to evaluate potential impacts of rice discharges on groundwater. This Order requires the California Rice Commission to develop regional groundwater monitoring workplans and, where necessary, groundwater quality management plans (GQMPs). The California Rice Commission is encouraged to coordinate with local groundwater management plans and integrated regional water management plans, where applicable, when developing regional groundwater monitoring workplans and GQMPs.
42. *California Department of Pesticide Regulation (DPR)*: DPR has developed a Groundwater Protection Program under the authority of the Pesticide Contamination Prevention Act (PCPA) (commencing with Food and Agriculture Code section 13142). The program is intended to prevent contamination of groundwater from the legal application of pesticides. In addition to activities mandated by the PCPA, DPR's program has incorporated approaches to identify areas vulnerable to pesticide movement, develop mitigation measures to prevent pesticide contamination, and monitor domestic drinking water wells located in groundwater protection areas. The Groundwater Protection Program can provide valuable information on potential impacts to groundwater from pesticides used on rice fields. If necessary, DPR and the county agricultural commissioners can use their regulatory authorities to address any identified impacts to groundwater or surface water attributable to pesticide discharges from agricultural fields.
43. *California Department of Food and Agriculture (CDFA)*: The CDFA Fertilizer Research and Education Program (FREP) coordinates research to advance the environmentally safe and agronomically sound use and handling of fertilizer materials. Currently, CDFA is developing nitrogen management training programs for farmers and Certified Crop Advisors (CCAs). Among other certification options available for nitrogen management plans, the CDFA training programs will be recognized as providing the training necessary for a farmer or CCA to certify nitrogen management plans. In addition, this Order requires the development of a template for a rice-specific nitrogen management plan. This Order leverages CDFA's work and expertise with respect to nitrogen management training and technical support to the professionals and third-parties that may be developing nitrogen management plans for individual rice Growers.
44. *The United States Department of Agriculture Natural Resources Conservation Service (NRCS)* administers a number of programs related to water quality. NRCS can provide technical assistance to growers and has identified practices that are protective of the environment and are feasible in an agricultural setting. The NRCS Environmental Quality Incentives Program (EQIP) provides cost share assistance for management practice installation. The NRCS has also provided assistance with research of management practice effectiveness. The California Rice Commission and its Growers are encouraged to utilize the information and resources available through the NRCS to meet the requirements of this Order.
45. The Central Valley Water Board will continue to work cooperatively with the other local, State and federal agencies to identify and leverage their efforts.

ENFORCEMENT FOR NONCOMPLIANCE WITH THIS ORDER

46. California Water Code section 13350 provides that any person who violates Waste Discharge Requirements may be: 1) subject to administrative civil liability imposed by the Central Valley Water Board or State Water Board in an amount of up to \$5,000 per day of violation, or \$10 per gallon of waste discharged; or 2) be subject to civil liability imposed by a court in an amount of up to \$15,000 per day of violation, or \$20 per gallon of waste discharged. The actual calculation and determination of administrative civil penalties must be set forth in a manner that is consistent with the State Water Board's Water Quality Enforcement Policy.
47. The State Water Board's Water Quality Enforcement Policy (Enforcement Policy) endorses progressive enforcement action for violations of waste discharge requirements when appropriate, but recommends formal enforcement as a first response to more significant violations. Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative growers in achieving compliance; 2) compel compliance for repeat violations and recalcitrant violators; and 3) provide a disincentive for noncompliance. Progressive enforcement actions may begin with informal enforcement actions such as a verbal, written, or electronic communication between the Central Valley Water Board and a grower. The purpose of an informal enforcement action is to quickly bring the violation to the grower's attention and to give the grower an opportunity to return to compliance as soon as possible. The highest level of informal enforcement is a Notice of Violation.

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

- (a) Failure to meet receiving water limitations, unless the Grower is implementing or has a documented plan to implement management practices in accordance with a Central Valley Water Board approved SQMP or GQMP and the time schedule provisions of this Order (Section XII).
 - (b) The discharge of waste to lands not owned, leased, or controlled by the Grower without written permission from the landowner.
 - (c) Failure to implement practices to prevent future exceedances of water quality objectives once made aware of an exceedance.
 - (d) Falsifying information or intentionally withholding information required by applicable laws, regulations or an enforcement order.
 - (e) Failure to implement a SQMP/GQMP.
 - (f) Failure to pay annual fee, penalties, or liabilities.
 - (g) Failure to monitor or provide information to the California Rice Commission as required.
 - (h) Failure to submit required reports on time.
 - (i) Failure to implement the applicable management practices, or equivalent practices, identified as protective of groundwater in the Management Practices Evaluation Report.
48. Under this Order, the California Rice Commission is tasked with developing monitoring plans, conducting monitoring, developing water quality management plans, and informing Growers of requirements. It is intended that the following progressive enforcement steps will generally be taken in the event that the California Rice Commission fails to comply with the terms and conditions of this Order or attached MRP:

- (a) *First notification of noncompliance.* The Central Valley Water Board will notify the California Rice Commission of the non-compliance and allow a period of time for the California Rice Commission to come back into compliance. This notification may be in the form of a verbal notice, letter, or written notice of violation, depending on the severity of the noncompliance.
- (b) *Second notification of noncompliance.* If the California Rice Commission fails to adequately respond to the first notification, the board intends to provide written notice to the California Rice Commission and potentially affected Growers of the failure to address the first notice.
- (c) *Failure of the California Rice Commission to adequately respond to the second notification.* Failure to adequately respond to the second notification may result in partial (e.g., affected areas or Growers) or full disapproval of the California Rice Commission to act as a lead entity, depending on the severity of noncompliance. Affected Growers would be required to obtain coverage for their waste discharge under other applicable general waste discharge requirements or submit a Report of Waste Discharge to the Central Valley Water Board.

GENERAL FINDINGS

- 49. This Order does not authorize violation of any federal, state, or local law or regulation.
- 50. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any action authorized under this Order, the Grower shall obtain authorization for an incidental take prior to construction or operation of the project. The Grower shall be responsible for meeting all requirements of the applicable Endangered Species Act.
- 51. This Order does not supersede the Central Valley Water Board's Basin plans and policies, including prohibitions (e.g., pesticides) and implementation plans (e.g., Total Maximum Daily Loads), or the State Water Board's plans and policies.
- 52. The Central Valley Water Board's Basin Plan prohibits the discharge of the pesticides carbofuran, malathion, molinate, methyl parathion and thiobencarb in irrigation return flows unless the discharger is following a Board-approved management practice. Because rice operations follow Board-approved management practices for thiobencarb, the Basin Plan Performance Goals apply and are regulated under a separate resolution for the rice pesticide program.¹⁶ Therefore, discharges of these pesticides from rice operations are not subject to the terms and provisions of this Order.
- 53. As stated in California Water Code section 13263(g), the discharge of waste into waters of the State is a privilege, not a right, and regulatory coverage under this Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.

¹⁶ The Rice Pesticides Program for control of the five pesticides is currently covered by Resolution No. R5-2010-9001. Of the five pesticides, only thiobencarb is still used in large quantities and under approved management practices. Carbofuran and molinate are no longer registered for use on rice.

54. This Order provides a procedure to enable board staff to contact Grower representatives and obtain access to the Grower's property so that the board may more efficiently monitor compliance with the provisions of this Order. Upon contact from the Central Valley Water Board during normal business hours, the California Rice Commission will review its grower list and contact the appropriate county agricultural commissioner's office to identify the appropriate contact person for the property in question. The California Rice Commission will then provide the Central Valley Water Board with the appropriate contact person and information needed for the board to contact operators of the property for inspection.
55. Any instance of noncompliance with this Order constitutes a violation of the California Water Code and its regulations. Such noncompliance is grounds for enforcement action, and/or termination of coverage for waste discharges under this Order, subjecting the discharger to enforcement under the California Water Code for further discharges of waste to surface water or groundwater.
56. All discharges from rice land operation are expected to comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges to storm drain systems or to other courses under their jurisdiction.
57. The fact that it would have been necessary to halt or reduce the discharge in order to maintain compliance with this Order shall not be a defense for violations of the Order by the Grower.
58. This Order is not a National Pollutant Discharge Elimination System Permit issued pursuant to the Federal Clean Water Act. Coverage under this Order does not exempt a facility from the Clean Water Act. Any facility required to obtain such a permit must notify the Central Valley Water Board.
59. California Water Code section 13260(d)(1)(A) requires persons subject to waste discharge requirements to pay an annual fee established by the State Water Board.
60. The Findings of this Order, supplemental information and details in the attached Information Sheet (Attachment A), and the administrative record of the Central Valley Water Board relevant to the Irrigated Lands Regulatory Program, were considered in establishing these waste discharge requirements.
61. The Central Valley Water Board has notified interested agencies and persons of its intent to adopt this Order for discharges of waste from rice lands within the Sacramento Valley, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.
62. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to this Order.
63. Any person affected by this action of the Central Valley Water Board may petition the State Water Board to review this action. The State Water Board must receive the petition within 30 days of the date on which the Central Valley Water Board adopted this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.

IT IS HEREBY ORDERED that, pursuant to California Water Code sections 13260, 13263, and 13267 and in order to meet the provisions contained in Division 7 of the California Water Code and regulations and policies adopted there under, all Growers in the Sacramento Valley represented by the California Rice Commission, their agents, successors, and assigns shall comply with the following:

I. Coverage

1. Order No. 2006-0053, Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Coalition Group Conditional Waiver), is hereby rescinded as it applied to Sacramento Valley rice growers in the California Rice Commission.
2. This Order applies to rice growers in the Sacramento Valley who are producers as defined by Food & Ag Code section 71032. By extension, this Order also applies to landowners that lease, rent or otherwise own land that is used by a producer of rice, and that discharge waste from rice fields to waters of the State.

II. Prohibitions

1. The discharge of waste to waters of the state from rice operations other than those described in the Findings of this Order is prohibited, unless such operations are subject to and/or covered by other waivers of WDRS or WDRs as issued by the Central Valley Water Board.
2. The discharge of hazardous waste, as defined in California Water Code section 13173 and Title 23 CCR section 2521(a), respectively, is prohibited.
3. The discharge of wastes (e.g., fertilizers, fumigants, pesticides) into groundwater via backflow through a water supply well is prohibited.
4. The discharge of any wastes (e.g., fertilizers, fumigants, pesticides) down a groundwater well casing is prohibited.

III. Receiving Water Limitations

A. Surface Water Limitations

1. Wastes discharged from Grower operations shall not cause or contribute to an exceedance of applicable water quality objectives in surface water or a trend of degradation that may threaten applicable Basin Plan beneficial uses, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

B. Groundwater Limitations

1. Wastes discharged from Grower operations shall not cause or contribute to an exceedance of applicable water quality objectives in the underlying groundwater or a trend of degradation that may threaten applicable Basin Plan beneficial uses, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

C. Compliance with Receiving Water Limitations

1. If the discharge of wastes from a Grower's operations does not meet the limitations in **III.A Surface Water Limitations** or **III.B. Groundwater Limitations**, the Grower is in compliance with this Order relative to sections III.A or III.B for a specific waste parameter provided:
 - a. The California Rice Commission has submitted a Surface Water Quality Management Plan or Groundwater Quality Management Plan for that waste parameter in accordance with Section VIII.F of this Order, and such plan is pending action by the Executive Officer or board; or
 - b. The Executive Officer or board has approved the applicable Surface Water Quality Management Plan or Groundwater Quality Management Plan for that waste parameter, and
 - i. The Grower is implementing or has a documented schedule to implement improved management practices consistent with the approved plan to achieve compliance with **III.A or III.B**, as applicable, and

- ii. The Grower is in compliance with **Section XII. Time Schedule for Compliance** of this Order.

IV. Provisions

A. General Specifications

1. The California Rice Commission will represent Growers in the Sacramento Valley by assisting Growers in complying with the relevant terms and provisions of this Order, including required monitoring and reporting as described in the Monitoring and Reporting Program (MRP) Order R5-2014-0032. However, individual Growers continue to bear ultimate responsibility for complying with this Order.
2. Growers who are subject to this Order shall implement water quality management practices, as necessary, to protect water quality. Water quality management practices can be instituted on an individual basis, or implemented to serve multiple Growers discharging to a single location.
3. Installation of groundwater monitoring wells or implementation of management practices to meet the conditions of this Order at a location or in a manner that could cause an adverse environmental impact as identified in the *Irrigated Lands Regulatory Program, Final Program Environmental Impact Report (PEIR)*¹⁷ shall be mitigated in accordance with the mitigation measures provided in Attachment C of this Order.
4. The provisions of this Order are severable. If any provision of the Order is held invalid, the remainder of the Order shall not be affected.

B. Requirements for Growers

1. Growers shall comply with all applicable provisions of the California Water Code, the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, and State Water Board plans and policies.
2. Growers shall comply with the attached Monitoring and Reporting Program (MRP) No. R5-2014-0032, and future revisions thereto.
3. Growers who are covered under this Order shall comply with the terms and conditions contained in this Order. For fields normally planted in rice, but which are rotated to crops other than rice, the grower must obtain coverage for their waste discharge for the period of time in which the field(s) is not planted in rice. Coverage can be provided by another applicable ILRP general order or individual WDRs.
4. Growers shall participate in California Rice Commission outreach events, at least annually, if any of the Grower's parcels are in an area governed by a SQMP/GQMP. The Grower shall review outreach materials to become informed of any water quality problems to address and the management practices that are available to address those issues. The Grower shall provide annual confirmation to the California Rice Commission that the Grower has attended an outreach event during the previous year and reviewed the applicable outreach materials.

¹⁷ On 7 April 2011, the Central Valley Water Board adopted Resolution R5-2011-0017, certifying the PEIR for the long-term irrigated lands regulatory program.

5. The Grower shall provide the California Rice Commission with information requested for compliance with this Order.
6. Growers shall implement water quality management practices as necessary to protect water quality and to achieve compliance with surface water and groundwater receiving water limitations of this Order (sections III.A and B).
7. Growers must prepare and submit a Farm Evaluation as required by Section VII.B of this Order.
8. All Growers shall implement practices that minimize excess nutrient application relative to crop consumption. Growers must prepare and implement a rice-specific nitrogen management plan as required by Section VII.C of this Order.
9. In addition to the reports identified in Sections VII and VIII of this Order, the Executive Officer may require Growers to submit additional technical reports pursuant to California Water Code section 13267.
10. The requirements prescribed in this Order do not authorize the commission of any act causing injury to the property of another, or protect the Grower from liabilities under other federal, state, county, or local laws. However, this Order does protect the Grower from liability alleged for failing to comply with California Water Code section 13260.
11. This Order does not convey any property rights or exclusive privileges.
12. This Order shall not create a vested right, and all such discharges of waste shall be considered a privilege, as provided for in California Water Code section 13263.
13. The Grower understands that the Central Valley Water Board or its authorized representatives, may, at reasonable hours, inspect the facilities¹⁸ and rice lands of persons subject to this Order to ascertain whether the purposes of the Porter-Cologne Act are being met and whether the Grower is complying with the conditions of this Order. To the extent required by California Water Code section 13267(c) or another applicable law, the inspection shall be made with the consent of the Grower, owner or authorized representative, or if consent is withheld, with a duly issued warrant pursuant to the procedure set forth in Title 13 Code of Civil Procedure Part 3 (commencing with section 1822.50). In the event of an emergency affecting the public health and safety, an inspection may be performed without the consent or the issuance of a warrant.
14. The Grower shall properly operate and maintain in good working order any facility, unit, system, or monitoring device installed to achieve compliance with the Order.
15. Where applicable, the Grower shall follow state, county or local agency standards with respect to water wells and groundwater quality when constructing new wells, modifying existing wells, or destroying wells. Absent such standards, at a minimum, the Grower shall follow the standards and guidelines described in the California Department of Water Resources' *Water Well Standards (Bulletins 74-81 & 74-90 combined)*.
16. The Grower shall maintain a copy of this Order, either in hard copy or electronic format, at the primary place of business, or the Grower's farming operations headquarters. The Grower shall also maintain excerpts of the Order's Grower requirements that have been provided by the

¹⁸ The inspection of Grower's facilities and rice lands does not include the Grower's private residence.

Executive Officer so as to be available at all times to operations personnel. The Grower and his/her designee shall be familiar with the content of this Order.

17. The Grower, or the California Rice Commission on its behalf as applicable, shall submit all required documents in accordance with section IX of this Order.
18. Growers shall, at a minimum, implement water quality management practices that meet the following farm management performance standards:
 - a. Minimize waste discharge offsite in surface water,
 - b. Minimize percolation of waste to groundwater,
 - c. Protect wellheads from surface water intrusion.
19. All Growers shall implement the applicable management practices, or equivalent practices, identified as protective of groundwater in the Management Practices Evaluation Report, if triggered.

C. Requirements for California Rice Commission

The California Rice Commission, as the third-party entity assisting Growers in complying with the relevant terms and provisions of this Order, shall perform the following:

1. Provide the Central Valley Water Board and make available for Growers an organizational or management structure identifying persons responsible for ensuring that program requirements are fulfilled.
2. Provide or make readily available to Growers the annual summaries of expenditures of fees and revenue used to comply with this Order.
3. Notify potentially affected Growers if the California Rice Commission has received a notice of violation (NOV) from the Central Valley Water Board and provide appropriate information regarding the reason(s) for the violation. The notification must be provided to those Growers within the area affected by the NOV within thirty (30) days of receiving the NOV from the board. For each NOV, the California Rice Commission must provide confirmation to the board when the notifications are completed. A summary of all notices of violation received by the California Rice Commission must be provided to or made available to all growers annually. The annual NOV summary may be part of a written or electronic communication to Growers.
4. Develop and implement plans to track and evaluate the effectiveness of water quality management practices pursuant to approved Surface Water Quality Management Plans (SQMPs) and/or Groundwater Quality Management Plans (GQMPs).
5. Provide timely and complete submittal of any plans or reports required by this Order.
6. Conduct required water quality monitoring and assessments in conformance with quality assurance/quality control requirements.
7. Within 3 months of adoption of this Order, inform Growers of program requirements.
8. Conduct education and outreach activities to inform Growers of program requirements and water quality problems, including exceedances of water quality objectives or trends in degradation of water quality, identified by the California Rice Commission or Central Valley Water Board. The California Rice Commission shall:

- a. Maintain attendance lists for outreach events specifically sponsored by the California Rice Commission for the purposes of this Order, provide Growers with information on water quality management practices that will address water quality problems and minimize the discharge of wastes from rice lands, and provide informational materials on potential environmental impacts of water quality management practices to the extent known by the California Rice Commission.
 - b. Provide an annual summary of education and outreach activities to the Central Valley Water Board. The annual summary shall include copies of the educational and management practice information provided to the Growers. The annual summary must report the total number of Growers who attended the outreach events and describe how Growers could obtain copies of the materials presented at these events
9. Work cooperatively with the Central Valley Water Board to ensure Growers are providing required information and taking necessary steps to address exceedances or degradation identified by the California Rice Commission or board that are associated with the production of rice. Provide an annual summary to the Central Valley Water Board of Growers whose membership has been revoked or is pending revocation due to: (1) failure to implement improved management practices within the timeframe specified by any applicable management plan; (2) failure to respond to an information request associated with an applicable management plan or other provisions of this Order; (3) failure to participate in applicable site-specific or representative monitoring studies for which the California Rice Commission proposes in order to comply with the provisions of this Order; or (4) otherwise failed to maintain good standing of their membership in the California Rice Commission.
 10. Provide the Central Valley Water Board with the contact information for a Grower when the board is seeking consent to access the Grower's rice operation through the following procedure: When requested by the Central Valley Water Board during normal business hours, the California Rice Commission will review its grower list and contact the appropriate county agricultural commissioner's office to identify the appropriate contact person for the property in question. The California Rice Commission will then provide the Central Valley Water Board with the appropriate contact person and information needed for the board to contact the person(s) with authority to provide consent for access to the property.
 11. Collect any fees from Growers required by the State Water Board pursuant to the fee schedule contained in Title 23 CCR. Such fees shall then be submitted to the State Water Board. The California Rice Commission is responsible for management of fee collection and payment of the State Water Board fees.

V. Effective Dates

1. This Order is effective upon adoption by the Central Valley Water Board on XX March 2014 and remains in effect unless rescinded or revised by the Central Valley Water Board.
2. Coverage of waste discharges from individual rice fields in the Sacramento Valley under this Order is effective upon adoption by the Central Valley Water Board.

VI. Permit Reopening, Revision, Transfer, Revocation, Termination, and Reissuance

1. This Order may be reopened to address any changes in state statutes, regulations, plans, or policies that would affect the water quality requirements for the discharges, including, but not

limited to, the Central Valley Water Board *Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins*.

2. The filing of a request by the California Rice Commission on behalf of its Growers for modification, revocation and re-issuance, or termination of the Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of the Order.
3. The California Rice Commission, on behalf of its Growers, shall provide to the Executive Officer, consistent with the commission's governing statutes contained in the California Food and Agriculture Code and other applicable state statutory requirements, any information which the Executive Officer may request to determine whether cause exists for modifying, revoking and re-issuing, or terminating the Order, or to determine compliance with the provisions of this Order that apply directly to the Grower.
4. After notice and opportunity for a hearing, the Order may be terminated or modified for cause as applied to individual growers identified by the Central Valley Water Board. Cause for such termination or modification, includes, but is not limited to:
 - a. Violation of any term or condition contained in the Order;
 - b. Obtaining the Order by misrepresentation; or
 - c. Failure to fully disclose all relevant facts.
5. After notice and opportunity for a hearing, the approval of the California Rice Commission to act as a third-party entity representing Growers may be partially (e.g., affected areas or Growers) or fully revoked. Cause for such termination includes, but is not limited to consideration of the factors in Finding 48 of this Order, and/or:
 - a. Violation of any term or condition contained in the Order that applies directly to the California Rice Commission;
 - b. If the California Rice Commission misrepresented itself, or failed to disclose fully all relevant facts known to the California Rice Commission, subject to the California Rice Commission's statutory limitations for disclosing information under the California Food and Agriculture Code; or
 - c. A change in any condition that results in California Rice Commission's inability to properly function as the third-party entity representing Growers in the Sacramento Valley or in facilitating Grower compliance with the terms and conditions of this Order.
6. The Central Valley Water Board will review this Order periodically and will revise the Order when necessary.

VII. Required Reports and Notices – Grower

The Central Valley Water Board or the Executive Officer may require any of the following reports and notices to be submitted electronically as long as the electronic format is reasonably available to the Grower, and only to the extent that the Grower has access to equipment that allows for them to submit the information electronically. If the Grower does not have such access, reports and notices must be submitted by mail, or delivered by hand. Reports and notices shall be submitted in accordance with section IX, Reporting Provisions, as well as MRP Order R5-2014-0032. Due dates for Grower required reports are summarized in Table 1 at the end of this Order. Growers must prepare and maintain the following reports as instructed below, and shall submit or make available such reports to the California Rice Commission or the Central Valley Water Board as identified below.

If there are fewer than 300,000-350,000 acres of rice planted in the Order area in the 2014 crop year, the Executive Officer may no later than 31 August 2014 delay by one year the requirements for the Grower to prepare the Farm Evaluation (section VII.B.) and Nitrogen Management Plan (section VII.C.). An Executive Officer decision to delay the initial Farm Evaluation submittal date also delays by one year the following associated deadlines: the date for the update of the Farm Evaluation; the date by which the Executive Officer can approve a reduction in the frequency of updates and submission of Farm Evaluations; and the date for the California Rice Commission to submit the initial Summary of Management Practice Information (Attachment B, section V.A., Report Component (23)).

A. Coverage Under the Order

Producers, and by extension landowners that lease, rent or otherwise own land that is used by a producer of rice that, as of the effective date of this Order, are enrolled under Order R5-2006-0053 as members of the California Rice Commission Coalition will be considered to be covered under this Order. Producers that are not also landowners must provide written notice of the requirements of this Order to any responsible landowner who is not also a producer.

Producers shall submit the approved notification form (see section VIII.J.) to the California Rice Commission by 1 March 2015. In lieu of submitting the approved form (per section VIII.J.), the information may be provided as part of the Farm Evaluation submittal (see section VII.B.) if the Farm Evaluation will be submitted by 1 March 2015.

By 1 March annually, thereafter, the Producer shall submit the updated form to the California Rice Commission, if there is a change in landowners that are non-producers of the parcels farmed by the Producer. In lieu of submitting the approved form (per section VIII.J.), the information may be provided as part of the Farm Evaluation submittal (see section VII.B.).

B. Farm Evaluation

By 1 March 2015, Growers must submit a completed Farm Evaluation to the California Rice Commission using a rice-specific form or web-based information system provided by the California Rice Commission. A copy of the rice-specific farm evaluation shall be maintained on site or be available electronically at the Grower's farming headquarters or primary place of business. A hard copy of the Farm Evaluation must be produced, if requested, should Central Valley Water Board staff conduct an inspection of the rice operation.

By 1 March 2016, and annually thereafter, the Grower must update their Farm Evaluation and submit it to the California Rice Commission.

After 1 March 2017, the Executive Officer may approve reduction in the frequency of updates and submission of Farm Evaluations, if the California Rice Commission demonstrates that year to year changes in Farm Evaluation updates are minimal and the Executive Officer concurs that the practices identified in the Farm Evaluations are consistent with practices that, when properly implemented, will achieve receiving water limitations and, where applicable achieve best practicable treatment or control.

C. Nitrogen Management Plan

By 1 March 2016, all Growers shall prepare, and update by 1 March annually thereafter, a rice-specific Nitrogen Management Plan. The Grower must use the rice-specific Nitrogen Management Plan Template approved by the Executive Officer (see Section VIII.B below). The Nitrogen Management Plan shall be maintained or be available electronically at the Grower's farming

operations headquarters or primary place of business. The Grower must provide, if requested, a hard copy of the Nitrogen Management Plan should board staff or an authorized board representative conduct an inspection of the Grower's rice operation.

Should a Groundwater Quality Management Plan requirement be triggered due to nitrates, Growers within the designated high vulnerability area must prepare and implement a certified Nitrogen Management Plan and submit a Nitrogen Management Plan Summary Report to the California Rice Commission for the previous crop year as described in Section VIII.F.

D. Mitigation Monitoring Report

Growers that implement mitigation measures specified in Attachment C of this Order shall submit the Mitigation Monitoring Report as specified in the MRP Section V.A annually, by 1 October, to the California Rice Commission. Mitigation monitoring shall include information on the implementation of CEQA mitigation measures, including the mitigation measure implemented, potential environmental impact the mitigation measure addressed, location of the mitigation measure (parcel number, county), and any steps taken to monitor the ongoing success of the measure.

E. Notice of Termination

If the Grower wishes to terminate coverage under this Order and withdraw its membership from the California Rice Commission, the Grower shall submit a complete notice of termination (NOT) to the Central Valley Water Board and the California Rice Commission.¹⁹ Termination of regulatory coverage will occur on the date specified in the NOT, unless the Central Valley Water Board specifies otherwise. All discharges of waste to surface water and groundwater shall cease before the date of termination, and any discharges on or after this date shall be considered in violation of the California Water Code, unless other WDRs or waivers of WDRs regulate the discharge.

VIII. Required Reports and Notices - California Rice Commission

The Central Valley Water Board or the Executive Officer may require any of the reports and notices to be submitted electronically, as long as the electronic format is reasonably available to the California Rice Commission. Reports and notices shall be submitted in accordance with Section IX, Reporting Provisions. Due dates for required reports are summarized in Table 2 at the end of this Order. The California Rice Commission must prepare the following reports.

If there are fewer than 300,000-350,000 acres of rice planted in the 2014 crop year in the Order area, the Executive Officer may decide by 31 August 2014 to delay by one year the requirements for the California Rice Commission to prepare the Farm Evaluation (section VIII.B.1) template, to prepare the Nitrogen Management Plan template (section VIII.B.2), and make available the Nitrogen Management Plan template (section VIII.B.2) to Growers.

A. Enrolled Growers GIS Map

The California Rice Commission shall provide to the Central Valley Water Board a Geographical Information System (GIS) map, updated annually, that delineates all parcels enrolled under this Order. The GIS map shall be submitted with the Annual Monitoring Report.

¹⁹ A Grower's rotation to another crop will not be considered a qualifying event, or create the need for termination of coverage from this Order if the Grower intends to rotate the operation in question back to rice. However, in the event that a Grower intends to rotate to another crop besides rice, then the Grower will need to obtain additional coverage for the non-rice crop for those years in question. A Grower would terminate regulatory coverage under this Order, if the Grower intended to obtain regulatory coverage under the general WDRs for Individual Growers (Waste Discharge Requirements General Order for Discharges from Irrigated Lands within the Central Valley Region for Dischargers not Participating in a Third-party Group: R5-2013-0100).

B. Templates

The California Rice Commission shall develop templates that will assist their Growers in submitting the information required by this Order.

1. Farm Evaluation Template

The California Rice Commission shall develop and submit a rice-specific Farm Evaluation Template to the Central Valley Water Board's Executive Officer by 30 November 2014.

The Farm Evaluation template must include confirmation by the Grower that the landowner has received notice of the Order and its provisions, if the producer is not also the landowner. Upon receiving approval of the template by the Central Valley Water Board's Executive Officer, the California Rice Commission shall then make the Farm Evaluation Template available to Growers within 30 days. The requirements for reporting of the Farm Evaluation data are specified in MRP Section V.A., Report Component 23.

2. Nitrogen Management Plan Template

The California Rice Commission shall submit a rice-specific Nitrogen Management Plan Template to the Central Valley Water Board's Executive Officer by 30 November 2014.

Upon receiving approval of the template by the Central Valley Water Board's Executive Officer, the California Rice Commission shall then make the Nitrogen Management Plan template available to Growers by 31 December 2015. Requirements for the Nitrogen Management Plan Template are described in MRP Section VI.B.

C. Groundwater Quality Assessment Report and Evaluation/Monitoring Workplans

This Order's strategy for evaluating groundwater quality and protection consists of 1) a Management Practices Evaluation Program, and 2) a Groundwater Quality Trend Monitoring Program, both of which are to be based on information developed in the Rice GAR. Each of these elements has its own specific objectives briefly described below, with more detail provided in the attached MRP.

1. Groundwater Quality Assessment Report

The Groundwater Quality Assessment Report (GAR) provides the foundational information necessary for design of the Management Practices Evaluation Program, the Groundwater Quality Trend Monitoring Program, and the Groundwater Quality Management Plan. Prior to the adoption of this Order, the California Rice Commission submitted a Rice GAR, which included the following:

- Assessment of all available, applicable and relevant data and information to determine the high and low vulnerability areas where discharges from irrigated lands may result in groundwater quality degradation;
- Priorities for implementation of monitoring and studies;
- A basis for establishing workplans to assess groundwater quality trends;
- A basis for establishing workplans and priorities to evaluate the effectiveness of agricultural management practices to protect groundwater quality; and

Updates to the Rice GAR shall be submitted to the Central Valley Water Board and Central Valley Salinity Coalition within five (5) years of this Order's approval and shall be updated every 5 years thereafter. Any updates to the Rice GAR shall include the elements described in MRP Section IV.A.

2. Management Practice Evaluation Program Workplan

Should a Groundwater Quality Management Plan be required (as described in Section VIII.F), the California Rice Commission shall develop a Management Practice Evaluation Program (MPEP) Workplan as described in Section IV.E of the attached MRP, or identify an equivalent program in the applicable Groundwater Quality Management Plan. The overall goal of a MPEP is to determine the effects, if any, rice farming practices have on groundwater under different conditions that could affect the discharge of waste from rice lands to groundwater (e.g., soil type, depth to groundwater, irrigation practice, and nutrient management practice). The MPEP Workplan shall be submitted to the Central Valley Water Board within six (6) months from when the management plan requirement is triggered.

3. Groundwater Quality Trend Monitoring Workplan

A Groundwater Quality Trend Monitoring Workplan must be submitted for Executive Officer approval by 1 October 2015. The Workplan must meet the goals, objectives, and other requirements described in Section IV.C of the attached MRP. The initial monitoring sites and parameters for the trend monitoring network are identified in the MRP. The initial sites and parameters may be modified by the Executive Officer, if necessary, to meet the goals, objectives, and requirements described in the MRP. The overall objectives of groundwater trend monitoring are to determine current water quality conditions of groundwater relevant to rice operations and develop long-term groundwater quality information that can be used to evaluate the regional effects of rice practices.

D. Surface Water Exceedance Reports

The California Rice Commission shall provide exceedance reports if surface water monitoring results show exceedances of adopted numeric water quality objectives or trigger limits, which are based on interpretations of narrative water quality objectives. Surface water exceedance reports shall be submitted in accordance with the requirements described in Section V.B of the MRP.

E. Annual Monitoring Report (AMR)

The California Rice Commission must submit the AMR to the Central Valley Water Board by 31 December of each year for the period covering 1 November (of the previous year) to 31 October. The AMR shall include the elements described in Section V.A of the MRP.

F. Surface Water/Groundwater Quality Management Plan (SQMP/GQMP)

1. SQMP/GQMP General Requirements

SQMP/GQMPs submitted by the California Rice Commission shall conform to the requirements provided in the MRP, Appendix MRP-1. Existing SQMPs that were developed and approved under the Coalition Group Conditional Waiver (Conditional Waiver Order R5-2006-0053) continue to apply under this Order and shall be implemented as previously approved. Changes to any management plan may be implemented by the California Rice Commission only after approval by the Executive Officer. The Executive Officer may require changes to a management plan if the current management plan approach is not making adequate progress towards addressing the water quality problem or if the information reported by California Rice Commission does not allow the Central Valley Water Board to determine the effectiveness of the management plan. Growers shall comply with the revised management plans once they are approved by the Executive Officer.

For newly triggered SQMP/GQMPs, the California Rice Commission shall submit a SQMP/GQMP to the Central Valley Water Board within sixty (60) days. For any SQMP or GQMP that addresses salt or nitrates, the SQMP or GQMP shall also be submitted to the Chair of the CV-SALTS

Executive Committee. This 60-day period begins the first business day after the California Rice commission's receipt of the field or laboratory results that reported the triggering exceedance. The Central Valley Water Board will post the proposed SQMP/GQMP for a public review and comment period. Stakeholder comments will be considered by Central Valley Water Board staff to determine if additional revisions are appropriate. The California Rice Commission may, at its discretion, implement outreach or monitoring contained in the proposed management-plan before approval. Growers shall comply with the management plans once they are approved by the Executive Officer.

The California Rice Commission shall ensure continued implementation of SQMP/GQMPs until approved as completed by the Executive Officer pursuant to the provisions contained in the attached MRP, Appendix MRP-1, section III. The California Rice Commission shall submit a progress report in compliance with the provisions contained in the attached MRP, Appendix MRP-1, section I.G.

2. Conditions Requiring Preparation of SQMP/GQMP

Surface Water Quality Management Plan (SQMP)

A SQMP shall be developed by the California Rice Commission where: (1) an applicable water quality objective or applicable water quality trigger limit is exceeded (considering applicable averaging periods²⁰) twice in a three year period for the same constituent at a monitoring location (trigger limits are described in section VII of the MRP) and rice lands may cause or contribute to the exceedances; (2) the Basin Plan requires development of a surface water quality management plan for a constituent or constituents discharged by rice lands, or (3) the Executive Officer determines that rice lands may be causing or contributing to a trend of degradation of surface water that may threaten applicable Basin Plan beneficial uses.

Groundwater Quality Management Plan (GQMP)

A GQMP shall be developed by the California Rice Commission where: (1) there is a confirmed exceedance²¹ (considering applicable averaging periods) of a water quality objective or applicable water quality trigger limit (trigger limits are described in section VII of the MRP) in a groundwater well and rice lands may cause or contribute to the exceedance; (2) the Basin Plan requires development of a groundwater quality management plan for a constituent or constituents discharged by rice lands; or (3) the Executive Officer determines that rice lands may be causing or contributing to a trend of degradation of groundwater that may threaten applicable Basin Plan beneficial uses.

If a GQMP is required to be developed for nitrate, then the GQMP must include increased nitrogen management plan requirements for growers subject to the GQMP. Increased nitrogen management plan requirements for such growers must include the preparation and implementation of a certified Nitrogen Management Plan and submission of a Nitrogen Management Plan Summary Report (requirements specified in MRP, Section VI.B). A certified Nitrogen Management Plan is one that is certified in one of the following ways: 1) Self-certified by the Grower who attends a California Department of Food and Agriculture or other Executive

²⁰ Exceedances of water quality objectives or water quality triggers will be determined based on available data and application of the appropriate averaging period. The averaging period is typically defined in in the Basin Plan, as part of the water quality standard established by the USEPA, or as part of the criteria being used to interpret narrative objectives. If averaging periods are not defined in the Basin Plan, USEPA standard, or criteria, or approved water quality trigger, the Central Valley Water Board Executive Officer will use the best available information to determine an appropriate averaging period.

²¹ A "confirmed exceedance of a water quality objective in a groundwater well" means that the monitoring data are determined to be of the appropriate quality and quantity necessary to verify that an exceedance has occurred.

Officer approved training program for nitrogen plan certification. The Grower must retain written documentation of their attendance in the training program; 2) Self-certified by the Grower that the plan adheres to a site-specific recommendation from the Natural Resources Conservation Service (NRCS) or the University of California Cooperative Extension. The Grower must retain written documentation of the recommendation provided; 3) Certified by a nitrogen management plan specialist as defined in Attachment E of this Order. Such specialists include Professional Soil Scientists, Professional Agronomists, Crop Advisors²² certified by the American Society of Agronomy, or Technical Service Providers certified in nutrient management in California by the National Resource Conservation Service (NRCS); or 4) Certified in an alternative manner approved by the Executive Officer. Such approval will be provided based on the Executive Officer's determination that the alternative method for preparing the Nitrogen Management Plan meets the objectives and requirements of this Order.

If the extent of Grower contribution to a water quality exceedance(s) or degradation trend is unknown, the California Rice Commission may propose activities to be conducted to determine the cause, or eliminate rice lands as a potential source instead of initiating a management plan. Requirements for source identification studies are set forth in the MRP, Appendix MRP-1, Section I.D.

3. SQMP/GQMP Not Required

At the request of the California Rice Commission or upon recommendation by Central Valley Water Board staff, the Executive Officer may determine the development of a SQMP/GQMP is not required. Such a determination may be issued if there is sufficient evidence indicating that the Growers discharging waste to the affected surface water or groundwater are meeting the receiving water limitations given in section III of this Order (e.g., evidence indicates that rice lands does not cause or contribute to the water quality problem.

4. Comprehensive Groundwater Quality Management Plan

Should the requirements to prepare a Groundwater Quality Management Plan be triggered for multiple constituents or aquifers (as described in Section VIII.F.2) the California Rice Commission may submit a Comprehensive Groundwater Quality Management Plan in the timeframe identified in Section VIII.F.1. All other provisions applicable to groundwater quality management plans in this Order and the associated MRP apply to the Comprehensive Groundwater Quality Management Plan. The Comprehensive Groundwater Quality Management Plan must be updated at the same time as the Management Plan Status Report (see attached MRP, Appendix MRP-1, section I.G) to address any constituents and areas that would have otherwise required submittal of a Groundwater Quality Management Plan.

5. Comprehensive Surface Water Quality Management Plan

Should the requirements to prepare a Surface Water Quality Management Plan be triggered for multiple constituents or surface waters (as described in Section VIII.F.2), the California Rice Commission may submit a Comprehensive Surface Water Quality Management Plan in the timeframe identified in Section VIII.F.1. All other provisions applicable to surface water quality management plans in this Order and the associated MRP apply to the Comprehensive Surface Water Quality Management Plan. The Comprehensive Surface Water Quality Management Plan must be updated at the same time as the Management Plan Status Report (see attached MRP,

²² Should the California Department of Food and Agriculture and the California Certified Crop Adviser's establish a specific nitrogen management certification, any Certified Crop Adviser who certifies a nitrogen management plan must have a nitrogen management certification.

Appendix MRP-1, section I.F) to address any constituents and areas that would have otherwise required submittal of a Surface Water Quality Management Plan.

G. Technical Reports

Where monitoring required by this Order is not effective in allowing the board to determine the effects of rice waste discharge on state waters or the effectiveness of water quality management practices being implemented, the Executive Officer may require technical reports be provided to determine the effects of rice operations or implemented management practices on surface water or groundwater quality.

H. Notice of Termination

If the California Rice Commission wishes to terminate its role in carrying out the third-party responsibilities set forth in section VIII of this Order and other applicable provisions, the California Rice Commission shall submit a notice of termination letter to the Central Valley Water Board and all of its Growers. Termination is effective 30-days from submittal of the notice of termination letter, unless otherwise specified in the letter. With its notice of termination sent to its Growers, the California Rice Commission shall inform its Growers of their obligation to obtain coverage under other WDRs or a waiver of WDRs for their discharges, or inform such Growers that they shall cease all discharges of waste to surface water and groundwater.

I. Total Maximum Daily Load (TMDL) Requirements

Approved TMDLs in the Basin Plan that apply to water bodies within the California Rice Commission's geographic area and have allocations for irrigated agriculture shall be implemented in accordance with the applicable Basin Plan provisions. Where required, the California Rice Commission shall coordinate with Central Valley Water Board staff to develop a monitoring design and strategy for TMDL implementation. Where applicable, SQMPs shall address TMDL requirements.

J. Non-producer Landowner Notification Form

By 30 September 2014, the California Rice Commission shall submit for Executive Officer approval a form that Producers will use to certify that any landowner who is not also a producer has been notified of the Order's requirements. The form must allow the Producer to identify the parcel number and county of the parcel(s) owned by the non-producer landowner(s) and include a signed certification by the Producer that the non-producer landowner(s) has been provided written notice of the requirements of this Order.

The requirement for the Non-producer Landowner Notification Form only applies if the Executive Officer delays the Farm Evaluation submittal requirements by one year (see section VII).

IX. Reporting Provisions

1. Growers and the California Rice Commission must submit required reports and notices in accordance with the requirements in this Order and attached Monitoring and Reporting Program Order R5-2014-0032, unless otherwise requested by the Executive Officer.
2. All reports shall be accompanied by a cover letter containing the certification specified in section IX.3 below. The cover letter shall be signed by a person duly authorized under California law to bind the party submitting the report.
3. Each person signing a report required by this Order or other information requested by the Central Valley Water Board shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel or represented Growers properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment for violations."

4. All reports prepared and submitted to the Executive Officer in accordance with the terms of this Order will be made available for public inspection at the offices of the Central Valley Water Board, except for reports, or portions of such reports, subject to an exemption from public disclosure in accordance with California law and regulations, including the Public Records Act, California Water Code section 13267(b)(2), and the California Food and Agriculture Code. If the California Rice Commission/Grower asserts that all or a portion of a report is subject to an exemption from public disclosure, it must clearly indicate on the cover of the report that it asserts that all or a portion of the report is exempt from public disclosure. The complete report must be submitted with those portions that are asserted to be exempt in redacted form, along with separately-bound unredacted pages (to be maintained separately by staff). The California Rice Commission/Grower shall identify the basis for the exemption. If the Executive Officer cannot identify a reasonable basis for treating the information as exempt from disclosure, the Executive Officer will notify the California Rice Commission/Grower that the information will be placed in the public file unless the Central Valley Water Board receives, within 10 calendar days, a satisfactory explanation supporting the claimed exemption. Data on waste discharges, water quality, meteorology, geology, and hydrogeology shall not be considered confidential.
5. To the extent feasible, when the Executive Officer directs a Grower to submit a report directly to the board, the report shall be submitted electronically to irrlands@waterboards.ca.gov, unless the Grower is unable to submit the report electronically. If unable to submit the report electronically, the Grower shall mail or personally deliver the report to the Central Valley Water Board. All reports from the California Rice Commission shall be submitted electronically to its Central Valley Water Board-assigned staff liaison. Upon notification by the Central Valley Water Board, all reports shall be submitted directly into an online reporting system, to the extent feasible.

X. Record-keeping Requirements

The Grower and California Rice Commission shall maintain any reports, or records required by this Order for five years. Records maintained by the California Rice Commission include reports and plans submitted by Growers to the California Rice Commission for purposes of complying with this Order²³. Individual Grower information used by the California Rice Commission to prepare required reports must be maintained electronically and associated with the Grower submitting the information. The maintained reports or records, including electronic information, shall be made available to the Central Valley Water Board upon written request of the Executive Officer. This includes all monitoring information, calibration and maintenance records of sampling equipment, copies of reports required by this Order, and records of all data used to complete the reports. Records shall be maintained for a minimum of five years from the date of sample, measurement, report, or application. This five-year period shall be extended during the course of any unresolved litigation regarding the discharge or when requested in writing by the Executive Officer.

²³ Information prohibited from disclosure under the California Food and Agriculture Code need not be provided to the Central Valley Water Board.

XI. Annual Fees

1. California Water Code section 13260(d)(1)(A) requires persons subject to waste discharge requirements to pay an annual fee established by the State Water Resources Control Board (State Water Board).
2. Growers shall pay an annual fee to the State Water Board in compliance with the Waste Discharge Requirement fee schedule set forth at 23 CCR section 2200. The California Rice Commission is responsible for collecting these fees from Growers and submitting them to the State Water Board on behalf of Growers.

XII. Time Schedule for Compliance

When a SQMP or a GQMP is required pursuant to the provisions in section VIII.F, the following time schedules shall apply as appropriate in order to allow Growers sufficient time to achieve compliance with the surface and groundwater receiving water limitations described in section II of this Order. The Central Valley Water Board may modify these schedules based on evidence that meeting the compliance date is technically or economically infeasible, or when evidence shows that compliance by an earlier date is feasible (modifications will be made per the requirements in section VI of this Order). Any applicable time schedules for compliance established in the Basin Plan supersedes the schedules given below (e.g., time schedules for compliance with salinity standards that may be established in future Basin Plan amendments through the CV-SALTS process, or time schedules for compliance with water quality objectives subject to an approved TMDL).

Surface water: The time schedule identified in a SQMP for addressing the water quality problem triggering its preparation must be as short as practicable, but may not exceed 10 years from the date the SQMP is submitted for approval by the Executive Officer. The proposed time schedule in the SQMP must be supported with appropriate technical or economic justification as to why the proposed schedule is as short as practicable.

Groundwater: The time schedule identified in a GQMP for addressing the water quality problem triggering its preparation must be as short as practicable, but may not exceed 10 years from the date the GQMP is submitted for approval by the Executive Officer. The proposed time schedules in the GQMP must be supported with appropriate technical or economic justification as to why the proposed schedules are as short as practicable.

This Order becomes effective on XX March 2014 and remains in effect unless rescinded or revised by the Central Valley Water Board.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 27 March 2014.

Original signed by

Pamela C. Creedon

PAMELA C. CREEDON, Executive Officer

Table 1 – Grower due dates for reports

Report	Date	Update
Notification of landowner	1 March 2015	Initial notification and when change in ownership for rice land
Farm Evaluation	1 March 2015, or 1 March 2016 upon Executive Officer Determination per Section VII.	Annually
Nitrogen Management Plan	1 March 2016, or 1 March 2017 upon Executive Officer Determination per Section VII.	Annually
Nitrogen Management Plan Summary Report	If identified within a high vulnerability area triggered by nitrates	Specified in GQMP
Mitigation Monitoring Report	By 1 October when mitigation measures are implemented	Annually

Table 2 – California Rice Commission due dates for reports

Report	Date	Updates
Notification of Non-producer Landowner Form	30 September 2014 upon Executive Officer Determination per Section VIII.	
Submittal of templates for Farm Evaluation and Nitrogen Management Plan	30 November 2014, or 30 November 2015 upon Executive Officer Determination per Section VIII.	As needed
Groundwater Trend Monitoring Workplan	1 October 2015	As needed
Farm Evaluation Management Practice Summary	31 December 2015, or 31 December 2016 upon Executive Officer Determination per Section VIII.	Every three years
Annual Monitoring Report	31 December	Annually
Surface Water Trend Monitoring Evaluation	31 December 2018 (2018 AMR)	Every three years

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
ATTACHMENT A TO ORDER NO. R5-2014-0032
INFORMATION SHEET
WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
SACRAMENTO VALLEY RICE GROWERS

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I. Overview

This attachment to Waste Discharge Requirements General Order for Rice Growers in the Sacramento Valley, Order No. R5-2014-0032 (referred to as the “Order”) is intended to provide information regarding the rationale for the Order; background information on the California Rice Commission (CRC) and rice farming operations; general information on surface and groundwater monitoring that has been conducted; and a discussion of the Order’s elements that meet required state policy.

More detailed information; including rice farming system and farming environment descriptions, as well as data presentation, and analysis are provided in the Groundwater Quality Assessment Report (GAR), as well as other documents previously submitted by CRC that are part of the administrative record.

II. Introduction

The Central Valley Water Board’s Irrigated Lands Regulatory Program (ILRP) was initiated in 2003 with the adoption of a conditional waiver of Waste Discharge Requirements (WDR)s for discharges from irrigated lands. The 2003 conditional waiver was renewed in 2006, and again in 2011. The conditional waiver’s requirements are designed to reduce wastes discharged from irrigated agricultural sites (e.g., tailwater, runoff from fields, subsurface drains) to Central Valley surface waters ([Central Valley Water Board 2011](#)).

In addition to providing conditions, or requirements, for discharge of waste from irrigated agricultural lands to surface waters, the Central Valley Water Board’s conditional waiver included direction to Central Valley Water Board staff to develop an environmental impact report for a long-term ILRP that would protect waters of the state (groundwater and surface water) from discharges of waste from irrigated lands. Although the requirements of the conditional waiver are aimed to protect surface water bodies, the directive to develop a long-term ILRP and environmental impact report is not as limited, as waters of the State include ground and surface waters within the State of California ([CWC](#), Section 13050[e]).

The Central Valley Water Board completed an [Existing Conditions Report](#) (ECR) for Central Valley irrigated agricultural operations in December 2008. The ECR was developed to establish baseline conditions for estimating potential environmental and economic effects of long-term ILRP alternatives in a program environmental impact report (PEIR) and other associated analyses.

In fall 2008, the Central Valley Water Board convened the Long-Term ILRP Stakeholder Advisory Workgroup (Workgroup). The Workgroup included a range of stakeholder interests representing local government, industry, agricultural coalitions, and environmental/environmental justice groups throughout the Central Valley. The main goal of the Workgroup was to provide Central Valley Water Board staff with input on the development of the long-term ILRP. Central Valley Water Board staff and the Workgroup developed long-term program goals and objectives and a range of proposed alternatives for consideration in a programmatic environmental impact report (PEIR) and corresponding economic analysis. In August 2009 the Workgroup generally approved the goals, objectives, and range of proposed alternatives for the long-term ILRP. The Workgroup did not come to consensus on a preferred alternative.

The Central Valley Water Board’s contractor, ICF International, developed the Program Environmental Impact Report (PEIR)¹ and Economics Report² for consideration by the board. The PEIR analyzed the range of proposed alternatives developed by the Workgroup. The Draft PEIR was released in July 2010,

¹ ICF International, 2011. Irrigated Lands Regulatory Program, Program Environmental Impact Report. Draft and Final. March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA.

² ICF International, 2010. Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program) (Economics Report).

and the Final PEIR was certified by the board in April 2011 (referred to throughout as “PEIR”). In June 2011, the board directed Central Valley Water Board staff to begin developing waste discharge requirements (orders) that would implement the long-term ILRP to protect surface and groundwater quality. During 2011, the board reconvened the Stakeholder Advisory Workgroup to provide additional input in the development of the orders. Also, during the same time, the board worked with the Groundwater Monitoring Advisory Workgroup to develop an approach for groundwater monitoring in the ILRP.

The board’s intent is to develop seven geographic and one commodity-specific general waste discharge requirements (general orders) within the Central Valley region for irrigated lands owners/operators that are part of a third-party group. The first of these orders was adopted in December 2012 for the Eastern San Joaquin River Watershed. The board also adopted a general order for irrigated lands owners/operators that are not part of a third-party group in July 2013, and third-party group general orders for the Tulare Lake Basin [September 2013], the Western Tulare Lake Basin Area [January 2014], and the Western San Joaquin River Watershed [January 2014] .

The geographic/commodity-based orders will allow for tailoring of implementation requirements based on the specific conditions within each geographic area, or specific to a commodity. At the same time, and to the extent appropriate, the board intends to maintain consistency in the general regulatory approach across the orders through the use of templates for grower reporting, as well as in the focus on high vulnerability areas and areas with known water quality issues. .

This Order is the only general order that is commodity-specific. Since rice in the Sacramento Valley is grown under generally similar conditions, using similar farming methods and rice lands are generally contiguous, the regulatory framework used for geographic specific Orders is generally applicable, but has been altered to reflect the unique circumstances associated with rice farming and a commodity-specific order.

A. Goals and Objectives of the Irrigated Lands Regulatory Program

The goals and objectives of this Order, which implements the long term ILRP for rice growers in the Sacramento Valley are described below. These are the goals described in the PEIR for the ILRP.³

“Understanding that irrigated agriculture in the Central Valley provides valuable food and fiber products to communities worldwide, the overall goals of the ILRP are to (1) restore and/or maintain the highest reasonable quality of state waters considering all the demands being placed on the water; (2) minimize waste discharge from irrigated agricultural lands that could degrade the quality of state waters; (3) maintain the economic viability of agriculture in California’s Central Valley; and (4) ensure that irrigated agricultural discharges do not impair access by Central Valley communities and residents to safe and reliable drinking water. In accordance with these goals, the objectives of the ILRP are to:

- *Restore and/or maintain appropriate beneficial uses established in Central Valley Water Board water quality control plans by ensuring that all state waters meet applicable water quality objectives.*
- *Encourage implementation of management practices that improve water quality in keeping with the first objective, without jeopardizing the economic viability for all sizes of irrigated agricultural operations in the Central Valley or placing an undue burden on rural communities to provide safe drinking water.*

³ ICF International, 2011. Irrigated Lands Regulatory Program, Program Environmental Impact Report. Draft and Final. March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA., page 2-6

- *Provide incentives for agricultural operations to minimize waste discharge to state waters from their operations.*
- *Coordinate with other Central Valley Water Board programs, such as the Grasslands Bypass Project WDRs for agricultural lands total maximum daily load development, CV SALTS, and WDRs for dairies.*
- *Promote coordination with other regulatory and non regulatory programs associated with agricultural operations (e.g., DPR, the California Department of Public Health [DPH] Drinking Water Program, the California Air Resources Board [ARB], the California Department of Food and Agriculture, Resource Conservation Districts [RCDs], the University of California Extension, the Natural Resources Conservation Service [NRCS], the USDA National Organic Program, CACs, State Water Board Groundwater Ambient Monitoring and Assessment Program, the U.S. Geological Survey [USGS], and local groundwater programs [SB 1938, Assembly Bill [AB] 3030, and Integrated Regional Water Management Plans]) to minimize duplicative regulatory oversight while ensuring program effectiveness.”*

B. Description of Waste Discharges from Irrigated Lands that may affect Water Quality

The definition of waste discharges from irrigated lands is provided in Appendix E as: “The discharge or release of waste to surface water or groundwater. Waste discharges to surface water include, but are not limited to, irrigation return flows, tailwater, drainage water, subsurface (tile) drains, stormwater runoff flowing from irrigated lands, aerial drift, and overspraying of pesticides. Waste can be discharged to groundwater through pathways including, but not limited to, percolation of irrigation or storm water through the subsurface, backflow of waste into wells (e.g., backflow during chemigation), discharges into unprotected wells and dry wells, and leaching of waste from tailwater ponds or sedimentation basins to groundwater. A discharge of waste subject to the Order is one that could directly or indirectly reach waters of the state, which includes both surface waters and groundwaters. Direct discharges may include, for example, discharges directly from piping, tile drains, wells, ditches or sheet flow to waters of the state, or percolation of wastes through the soil to groundwater. Indirect discharges may include aerial drift or discharges from one parcel to another parcel and then to waters of the state...”

As described in the definition, there exist multiple potential pathways for wastes from irrigated lands to waters of the state, where such waste discharge could affect the quality of waters of the state. Basic physical processes (e.g., contaminants going into solution in water and gravity) result in water containing waste to flow through soil or other conduits to underlying groundwater or result in water flowing over the land surface into surface water. In addition, material sprayed on the crop (such as pesticides) can drift in the wind and reach surface waters. Since farming takes place on landscapes connected to the surrounding environment (an open system), a farmer cannot prevent these physical processes from occurring. However, a farmer can take steps to limit the amount of wastes discharged and the subsequent effect on water quality.

III. Rice Production in California

A. Rice Lands in the Sacramento Valley⁴

The Sacramento Valley is surrounded by the Coast, Cascade, and Sierra Nevada mountain ranges which have weathered and eroded to fill the valley bottom with alluvial material. Within these alluvial plains are a relatively wide variety of soils and soil conditions. Rice is generally grown in three landforms, alluvial plains (including terrace soils), floodplains, and flood basins.

Alluvial plains include **terrace** soils that are formed on the valley margins from mixed alluvium and are among the oldest in the valley. Terrace soils have a loam or clay loam surface horizons of 10 to 35% clay and a dense clay layer below. Over time, periodic flooding allows coarser materials to travel farther down

⁴ Most of the information in this section is taken from *Rice Nutrient Management in California*, John F. Williams, UC Agriculture and Natural Resources Publication 3516.

the stream, where they may be buried by subsequent deposition of fine-grained materials. A cementation or consolidation process of this alluvial material may occur after being deposited and buried at considerable depth. With cementation and consolidation, pore spaces are reduced, lowering the ability of the materials to hold and transport water vertically. Erosion of the surface may subsequently bring these cemented and consolidated layers closer to the surface. Significant rice acreage is planted on this landform on the east side of the Sacramento Valley.

Floodplains occur when natural stream channel flows overtop banks due to intense precipitation and/or elevated stream flow from upstream precipitation and/or snowmelt. Sediments suspended in the floodwaters deposit along the channel banks, with coarse sediments near the streams, and finer sediments settling in the bottom of broad basins known as **flood basins**. The Sutter, Butte, Colusa, and Natomas basins are examples of these flood basin landforms, which contain most of California's rice fields.

Soils in the flood basin landforms generally have high proportions of clay and silt-sized particles and poor internal drainage. Soil surface horizons typically have 30 to 60 percent clay and have high shrink and swell capacity with changes in soil moisture. It is estimated that 75% of the rice on the west side of the Sacramento Valley and 60% on the east side is grown on basin soils, with fewer acres on floodplains, alluvial plains, and terraces.

Fine-textured soils of the Sacramento Valley are expected to have relatively high cation exchange capacity, allowing positively charged ions such as ammonium, potassium, sodium and calcium to be adsorbed on the clay/soil surface. Negatively charged ions, such as nitrate, would be more readily transported in solution through the soil profile.

B. Rice Farming in the Sacramento Valley

California rice is an annual crop, with only one harvest per year. About 90% of the rice grown in the state is medium grain cultivars. Over 95% of all rice production in the Sacramento Valley is in nine counties – Butte, Colusa, Glenn, Placer, Sacramento, Sutter, Tehama, Yolo and Yuba (Figure 1).⁵ All rice producing areas in those counties are contained within the Sacramento Valley. According to the California Department of Food and Agriculture (CDFA) California Agricultural Statistics, the nine counties harvested about 540,510 acres of rice for the 2011 growing season.⁶

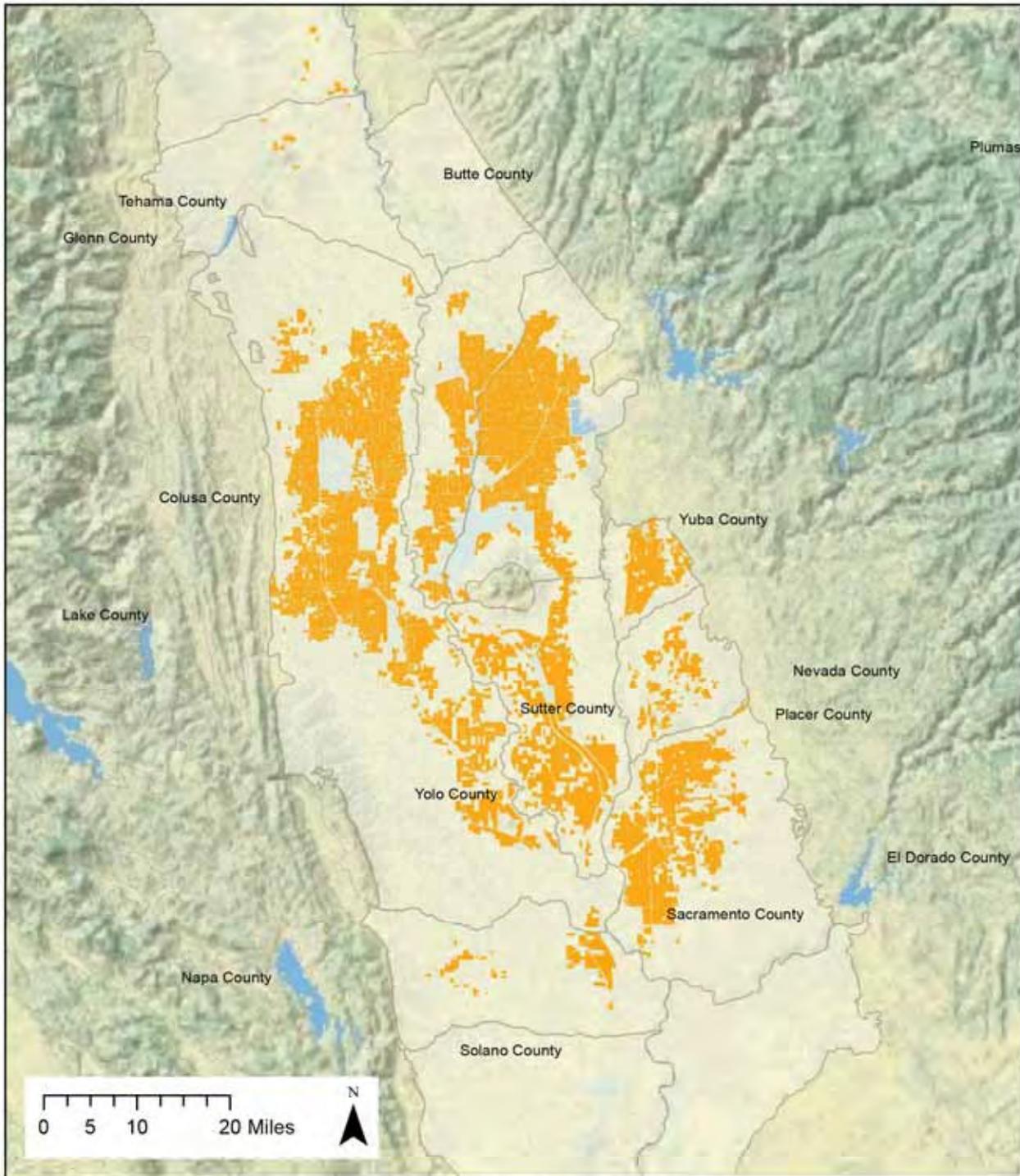
Areas where rice is grown require a specific type of soil physically suited to rice production. The soil must have restricted drainage caused by high clay content or a hardpan/claypan layer that facilitates season-long ponding without excessive percolation of irrigation water (Figure 2).⁷ Rice-only soils, historically farmed only to rice, have very poor internal drainage due to high clay content or hardpan at less than 3 feet deep making them unsuitable for most other crops. These rice-only soils tend to have poor yields and high input costs when rotated to other crops. For this reason, many rice fields are designed to optimize rice production with permanent levees and low-grade slopes, further limiting their utility for crop rotation. Some soils with expandable clay minerals (vertisols) and hardpans greater than 3 feet deep are suitable for rice and non-rice crops, allowing for crop rotation. Rotations can be used to improve weed and disease management and soil fertility, but are not essential for conventional rice production.

⁵ The figure is from the CRC Groundwater Assessment Report (GAR). The rice lands shown are based on integrating California Department of Water Resources (DWR) maps showing crops grown in each county.

⁶ From 2002 to 2010, the rice acreage harvested in the nine counties varied from 500,048 to 573,235 acres based on County Crop Reports.

⁷ From GAR showing rice lands overlay on NRCS soil drainage classifications.

Figure 1: Rice Land (DWR), showing lands where rice is normally grown



Data Sources: Groundwater Basins, Rice Crop (California DWR 2010), Basemap, County (ESRI 2011), Datum is NAD83

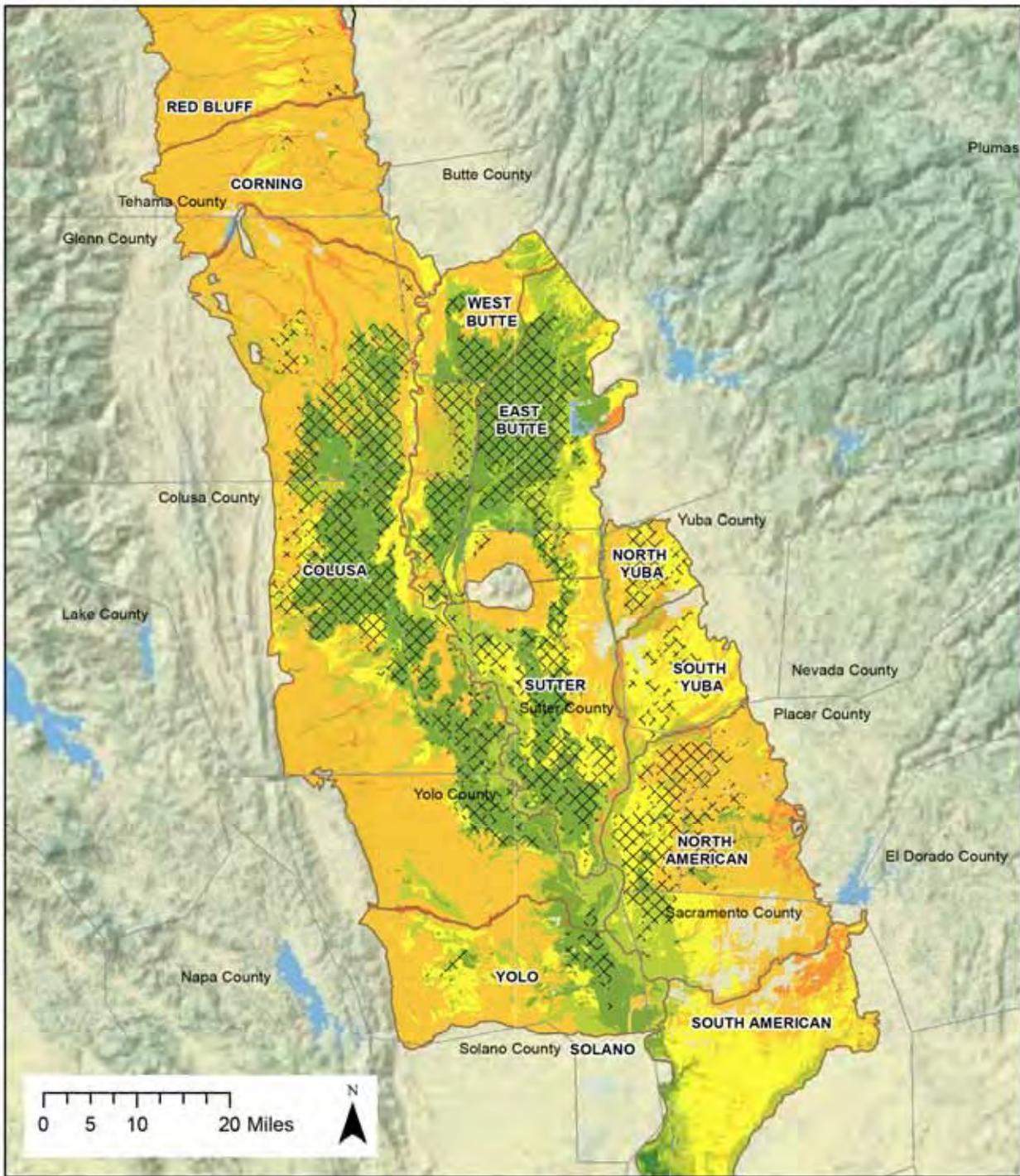
Legend

-  County Boundary
-  Groundwater Basins
-  Rice Lands (DWR)

Note: Figure from the Rice-Specific Groundwater Assessment Report, Map 2-3



Figure 2: Rice Land and Soil Drainage



Data Sources: Groundwater Basins, Rice Crop (California DWR 2010), Drainage Class (NRCS 2012), Basemap, County (ESRI 2011). Datum is NAD83.

Legend

- | | |
|---------------------------------|--------------------|
| NRCS Soil Drainage Class | County Boundary |
| Very poorly drained | Groundwater Basins |
| Poorly drained | Rice Lands (DWR) |
| Somewhat poorly drained | |
| Moderately well drained | |
| Well drained | |
| Somewhat excessively drained | |
| Excessively drained | |

Note: Figure from the Rice-Specific Groundwater Assessment Report, Map 2-7



C. Water Management in Rice Fields

Rice is farmed in standing water. Medium grain rice varieties were specifically bred for California conditions. This breeding program decreased the stalk height, reducing the desired standing water depth. Breeding has also shortened the growing season to about 120 days during which rice is irrigated.

Water is managed in rice fields to minimize wasted water, nutrients, and pesticides. Rice is grown in standing water contained by small levees. Fields are generally laser-leveled (slope less than 0.1%, or 0.1 feet per 100 feet) to allow for a slow flow rate through the fields and to control the rate of water released. Due to these irrigation management controls, sediment loads in irrigation runoff are low, and particle-coagulant additives are not required or used for sediment control. Further information on water management systems and practices can be found the University of California Cooperative Extension (UCCE) Rice Project website.⁸

In a normal season, field preparation generally starts in mid-February to March, before rice seeding. Rice seed is generally sown by airplane into a flooded field, although Growers may elect to plant in a dry field (drill-seed). Seeding typically takes place from mid-April to the end of May. Water management after seeding depends on the pesticides to be applied. Pesticide application can occur in April, but most typically happens in the May through June period. During this period and into early July, water may be released from the field to expose small aquatic weeds for control. From mid-July to mid-August (after herbicide application), water is held on the fields to allow herbicides to degrade. Water is added as needed to maintain a constant water level and a favorable water temperature range for growth.

All California rice is flooded during growth and grain formation. A top-dressing (mid-season application) of nitrogen may be made during the water hold period, if needed. Rice field drainage before harvest typically occurs from mid-August through September. Drainage and drying is necessary to allow harvester and truck access to fields. Timing of harvest is based on the moisture content of the rice kernel so as to optimize the quality and yield of head rice.⁹ After harvest, rice fields are generally flooded to facilitate decomposition of rice straw and to provide waterfowl habitat. No application of fertilizers or pesticides occurs on rice fields during the winter, until the fields are once again drained in mid-February or March. Field preparation for the next season may include applications of fertilizers before seeding. Factors such as weather conditions may affect planting and pesticide application. A summary of the rice farming calendar and approximate dates are shown in Table 1.

Table 1: Summary of Rice Farming Calendar

Rice Farming Calendar		Month*
Winter drainage	Fields drained for planting; pre-plant activities	mid-February thru March
Irrigation season	Peak pesticide use season**	April thru May; June thru July
	Rice development; fields flooded	July thru August
Fall drainage	Fields drained and allowed to dry for harvesting	mid-August thru September
Winter flood	Fields flooded for rice straw decomposition and waterfowl habitat	October thru mid- February

- * Start of the rice growing season depends on factors such as weather conditions, rice variety being grown (length of growing season), and planting method. The months listed are approximate.
- ** Most pesticide applications take place in May and June. Only occasional use can occur in early July.

⁸ http://www.plantsciences.ucdavis.edu/uccerice/rice_production/planting_water_mgmt.htm

⁹ Head rice yield is the portion of kernels greater than 75% of intact length after milling. Head rice commands a higher price than broken kernels.

D. Nitrogen Management for Rice Fields

Rice primarily absorbs nitrogen in the form of ammonium,¹⁰ which is the most common form of inorganic nitrogen in flooded soils. Nitrogen is generally applied below the soil surface as aqua ammonia (NH₃ in water) or urea (CO(NH₂)₂).¹¹ Fields are immediately flooded creating an anaerobic soil condition that minimizes volatilization and nitrification¹² of ammonium. Some nitrogen loss occurs by ammonium diffusion from the anaerobic layer to the aerobic layer and subsequent nitrification to the nitrate (NO₃⁻) form. Nitrate can also form in soil zones that temporarily become aerobic when fields are drained for foliar-active herbicides¹³. When the field is re-flooded and the soil again becomes anaerobic, microbes convert residual nitrate into nitrogen gas (N₂), with the ammonium-nitrogen again remaining in a stable state. Vertical leaching of nitrates is minimal due to the general predominance of ammonium in the soil (and general absence of nitrate-nitrogen forms), and to the generally low permeability of rice soils. After herbicide applications, fields remain flooded until the drainage before harvest. After drainage, nitrification may again occur in aerobic soil zones, but most rice fields are flooded during the winter for rice straw decomposition and for waterfowl habitat. Where nitrate is formed, denitrification will occur.^{14,15}

E. Pesticide Application and Management for Rice

Herbicides (pesticides applied to control weeds) and copper sulfate used by both organic and conventional rice constitute most of the pesticide load applied to the crop.¹⁶ The decision for dry or wet (flooded) planting of rice seed may be based on disrupting prevalent types of weeds in a rice field.

Several rice pesticides have mandatory field hold times derived from the scientific data review required for registration. The resulting water holds are included as the mandatory label requirements. The water holds were developed to provide for in-field degradation of pesticides before the release of the field water to drains and other surface waters. Water holds have become industry standard practice in California to address aquatic toxicity, taste complaints, environmental fate, and pesticide efficacy. The original water holds were developed in cooperation with technical resources such as the University of California Cooperative Extension, Rice Research Board and pesticide registrants. Rice-specific permit conditions were developed to require additional conditions of the registered use of those products. In conjunction with the water holds, the California Department of Pesticide Regulations (DPR) requires seepage controls for all rice pesticides having mandatory water-holding requirements.¹⁷

Pesticides that can be applied to rice are limited. Figure 3 shows when pesticides are normally applied. Applications are made in accordance with the label specifications¹⁸ and to optimize effectiveness and

¹⁰ Williams, J.F. (editor), *Rice Nutrient Management in California*. 2010. University of California: Agriculture and Natural Resources. Publication 3516.

¹¹ More information on subsurface and surface application can be found in Linqvist, B.A., Hill, J.E., Mutters, R.G., Greer, C.A., Hartley, C., Ruark, M.D., and van Kessel, C., 2009. Assessing the Necessity of Surface-Applied Preplant Nitrogen Fertilizer in Rice Systems, *Agronomy Journal* 101-9006-915.

¹² Nitrification refers to oxidation or addition of oxygen to form nitrates (NO₃⁻); denitrification refers to the reduction or the loss of oxygen to form nitrogen gas (N₂).

¹³ Foliar-active herbicides require adequate leaf surface area for absorption by the plant of the herbicide. If application is by ground, the surface has to be dry enough to support application equipment. Drainage can last up to three weeks, depending on the soil type, climate conditions, and the herbicide to be applied.

¹⁴ Linqvist, B.A., Koffler, K., Hill, J.E. and van Kessel, C., 2011. Rice field drainage affects nitrogen dynamics and management. *California Agriculture* 65:80-84.

¹⁵ Reddy, K.R., 1982. Nitrogen cycling in a flooded-soil ecosystem planted to rice (*Oryza sativa* L.), *Plant and Soil* 67:209-220.

¹⁶ Copper sulfate is used as an algaecide, fungicide and insecticide. It is applied to a flooded field and the copper appears to be bound to organic matter in the soil.

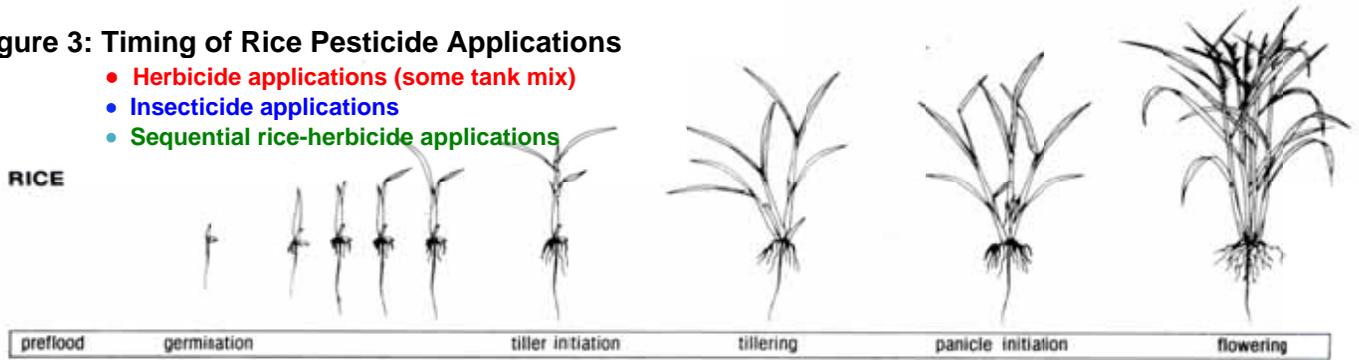
¹⁷ Pesticide Use Enforcement Program Standards Compendium, Volume 3, *Restricted Materials and Permitting* Appendix C, Subsection C.2.2, General Water-Holding.

¹⁸ Growers are required to follow label specifications which are approved by the US Environmental Protection Agency (EPA). Labels may be specific for certain states due to additional requirements within that state.

minimize damage to the crop. Timing for herbicide application is critical, with a set window for effectiveness and prevention of crop damage.

Figure 3: Timing of Rice Pesticide Applications

- **Herbicide applications (some tank mix)**
- **Insecticide applications**
- **Sequential rice-herbicide applications**



Early Season (March–April)		Mid Season (May–June)		Late Season (June–July)	
Pre-Flood	Germination	Tiller Initiation	Tillering	Panicle Initiation	Flowering
	<p>Bensulfuron-methyl Permanent flood</p> <p>Carfentrazone-ethyl Permanent flood 5-day static; 30-day release</p> <p>Clomazone Permanent flood 14-day water hold</p>	<p>Bensulfuron-methyl Pinpoint flood</p> <p>Bispyribac-sodium Pinpoint flood</p> <p>Cyhalofop-butyl Pinpoint flood 7-day water hold</p> <p>Propanil Pinpoint flood</p> <p>Thiobencarb (Bolero and Abolish) Permanent flood</p> <p>Triclopyr TEA Pinpoint flood 20-day water hold</p> <p>Bispyribac-sodium/ Thiobencarb (Abolish) Pinpoint flood 30-day water hold</p> <p>Propanil/Thiobencarb (Abolish) Permanent flood 30-day water hold</p>			
	<p>Lambda Cyhalothrin Border treatment 7-day water hold</p> <p>(s)-Cypermethrin Border treatment 7-day water hold</p>				<p>Lambda Cyhalothrin Border treatment 7-day water hold</p> <p>(s)-Cypermethrin Border treatment 7-day water hold</p>
	<p>Bispyribac-sodium, Thiobencarb (Bolero) 30-day water hold Permanent Flood</p> <p>Bispyribac-sodium, Propanil Pinpoint flood</p> <p>Clomazone, Bensulfuron-methyl 14-day water old Permanent flood</p> <p>Clomazone, Bispyribac-sodium 14-day water hold Permanent flood</p> <p>Clomazone, Carfentrazone-ethyl up to 30-day water hold Permanent flood</p> <p>Clomazone, Propanil 14-day water hold Permanent flood</p> <p>Clomazone, Propanil/Triclopyr TEA 20-day water hold</p> <p>Cyhalofop-butyl, Bensulfuron-methyl 7-day water hold Pinpoint flood</p> <p>Cyhalofop-butyl, Bispyribac-sodium 7-day water hold Pinpoint flood</p> <p>Cyhalofop-butyl, Propanil 7-day water hold Pinpoint flood</p> <p>Propanil, Cyhalofop-butyl 7-day water hold Pinpoint flood</p> <p>Carfentrazone-ethyl, Cyhalofop-butyl 30-day water hold, 7-day water hold Pinpoint flood</p>				

IV. California Rice Commission

The California Rice Commission (CRC) is a state statutory organization established by California Food and Agriculture Code¹⁹ to represent all producers and handlers²⁰ of rough (paddy) or milled rice²¹ (*Oryza sativa*) from any source within the State of California. The CRC does not represent growers that produce wild rice.²²

The CRC submitted a Notice of Intent in October 2003 and received a Notice of Applicability (NOA) from the Executive Officer in June 2004. The NOA approved the CRC to operate as the lead entity for rice growers in the Sacramento Valley under the previous Coalition Group Conditional Waiver. Similar to the Coalition Group Conditional Waiver, this Order has been written for the CRC to provide a lead role in conducting monitoring, educating rice growers, developing and implementing water quality management plans, and interacting with the Central Valley Water Board on behalf of its rice growers. Under the Conditional Waiver, the CRC conducted surface water quality monitoring and submitted annual reports according to requirements described in CRC-specific Monitoring and Reporting Program Orders. Management plans were developed, implemented, and completed. The CRC routinely provides rice growers with water quality information during mandatory grower meetings and through the CRC website and newsletter.

Since its inception in 1983, the Rice Pesticides Program (RPP) has monitored rice pesticides and required implementation of management practices by rice growers to address significant water quality concerns that arose related to fish toxicity and drinking water taste complaints. The RPP was originally administered by the California Department of Fish and Game, Department of Pesticide Regulation, and Central Valley Water Board. In 2003, the CRC assumed responsibility for overseeing and documenting compliance with the RPP. The RPP is a separate program from the ILRP, currently under Resolution No. R5-2010-9001, which specifies approved management practices for five rice pesticides to meet Basin Plan performance goals. Currently, only one of the five rice pesticides (thiobencarb) is applied by rice in significant quantities and requires RPP monitoring. As part of the RPP, the CRC provides monitoring at four primary sites for the pesticides and has initiated management practices and outreach to ensure compliance with the performance goals. Management practices initiated by the RPP include water-holding requirements; drift minimization, water management including reporting of emergency releases, seepage mitigation measures, and mandatory stewardship training for permit applicants.

The CRC, under Food & Agricultural Code, cannot release information regarding its producers or handlers.²³ In Food & Agricultural Code, § 71079, the CRC “may present facts to, and negotiate with, local, state, federal, and foreign agencies on matters that affect the rice industry.” This Order authorizes the CRC to represent all Sacramento Valley producers and, by extension, landowners of land used by a producer of rice (hereafter referred to as Growers²⁴) to comply with specified aspects of the Order. Discharges governed by this Order include discharges of waste from rice land only within the counties of Sacramento, Sutter, Yuba, Butte, Glenn, Colusa, Yolo, Placer, and Tehama.

¹⁹ Food & Agricultural Code, Division 22, Chapter 9.5, Article 1, section 71000.

²⁰ Producer is defined as any person who produces or causes to be produced, rice. Handler is any person in the business of marketing rice and handles 100,000 hundredweight (10,000,000 pounds) or more of rough rice or the equivalent amount of milled rice during a marketing season.

²¹ Rough or paddy rice is rice that comes from the field after harvest with the hull or husk still covering the rice kernel. Milling removes the outer hull (brown rice) and may be continued to remove the entire hull and the germ to produce white rice.

²² Wild rice is technically a species of grasses forming the genus *Zizania*.

²³ Food & Agricultural Code, Division 22, Chapter 9.5, § 71089(a) states “[t]he Commission and the secretary shall keep confidential and shall not disclose, except when required by court order after a hearing in a judicial proceeding, all lists in their possession of persons subject to this chapter.”

²⁴ For the purposes of this Order, Grower(s) is defined to mean a producer of rice as defined in Food & Agricultural Code § 71032, or a landowner that leases, rents, or otherwise owns land that is used by a producer of rice.

As required by the Order, the CRC will identify the locations of Sacramento Valley rice growing operations in a manner that does not violate Food & Agricultural Code § 71089(a). The CRC will map, likely with satellite images and/or aerial surveys, land planted to rice in the Sacramento Valley. The CRC will then submit a Geographic Information System (GIS) shapefile with enough detail to overlay assessor's parcel number (APN) data. The Order requires Growers to perform a Farm Evaluation that identifies water quality management practices used by the Grower. The evaluation will be updated annually by Growers, unless the Executive Officer otherwise determines that annual updates are unnecessary. The Monitoring and Reporting Program (MRP) of this Order requires that the CRC identify use of the management practices in GIS at a township level. To update the information, the CRC may either provide updates of the shapefile or submit APNs every three years with the Farm Evaluation update. If rice acreage varies by more than 20% from the last update, an update of the shapefile is required for that year. The updates are required because some rice areas may rotate a crop occasionally, even though rice acreage is generally not suitable for other crops.²⁵

V. Surface Water Monitoring

A. Surface Water Monitoring Sites

The CRC has monitored rice discharges at four primary sites and five secondary sites under the ILRP (Table 2). The four primary sites were established under the Rice Pesticides Program²⁶ (RPP) and found to be representative of rice field discharges for those pesticides. The CRC also submitted a report, *Basis for Water Quality Monitoring Program*, in October 2004 that contained an assessment and evaluation of the four primary sites as being representative of rice field discharges.²⁷ The report concluded that the primary sites -- CBD5, BS1, CBD1, and SSB – capture the majority of rice field discharges. Because there is dilution from other inputs (both agricultural and non-agricultural) at these sites, monitoring for the ILRP is also conducted at three upstream secondary sites (Figure 4).

Table 2: CRC Surface Water Monitoring Sites

Site Type	Site Code	Site Name	Latitude	Longitude
Primary	520XCBDWR	Colusa Basin Drain #5 (CBD5)	39.1833 N	-122.0500 W
Primary	520CRCBS1	Butte Slough at Lower Pass Rd (BS1)	39.1875 N	-121.9000 W
Primary	520XCBDKL	Colusa Basin Drain above Knights Landing (CBD1)	38.8125 N	-121.7731 W
Primary	520CRCSSB	Sacramento Slough Bridge near Karnak (SSB)	38.7850 N	-121.6533 W
Secondary	520CRCLCF	Lurline Creek; upstream site for CBD5 (F)*	39.2184 N	-122.1511 W
Secondary	520CRCCCG	Cherokee Canal, upstream site for BS1*(G)*	39.3611 N	-121.8675 W
Secondary	520CRCOOH	Obanion Outfall at DWR PP on Obanion Rd, upstream site for SSB (H)*	39.0258N	-121.7272 W
Secondary	515CRCJSS	Jack Slough (JS)**	39.1804	-121.571100
Secondary	519CRCLCC	Lower Coon Creek (LCC)**	38.8715	-121.580800

* Monitoring was initiated in 2009 for sites F, G, and H.

** JS and LCC were removed as monitoring sites in 2008 and 2007, respectively, due to low or stagnant flow during the monitoring season.

²⁵ A Grower's rotation to another crop will not be considered grounds for termination of coverage from this Order if the Grower intends to rotate the operation in question back to rice. However, if the Grower intends to rotate to another crop besides rice, then the Grower will need to obtain additional coverage for the non-rice crop for those years in question.

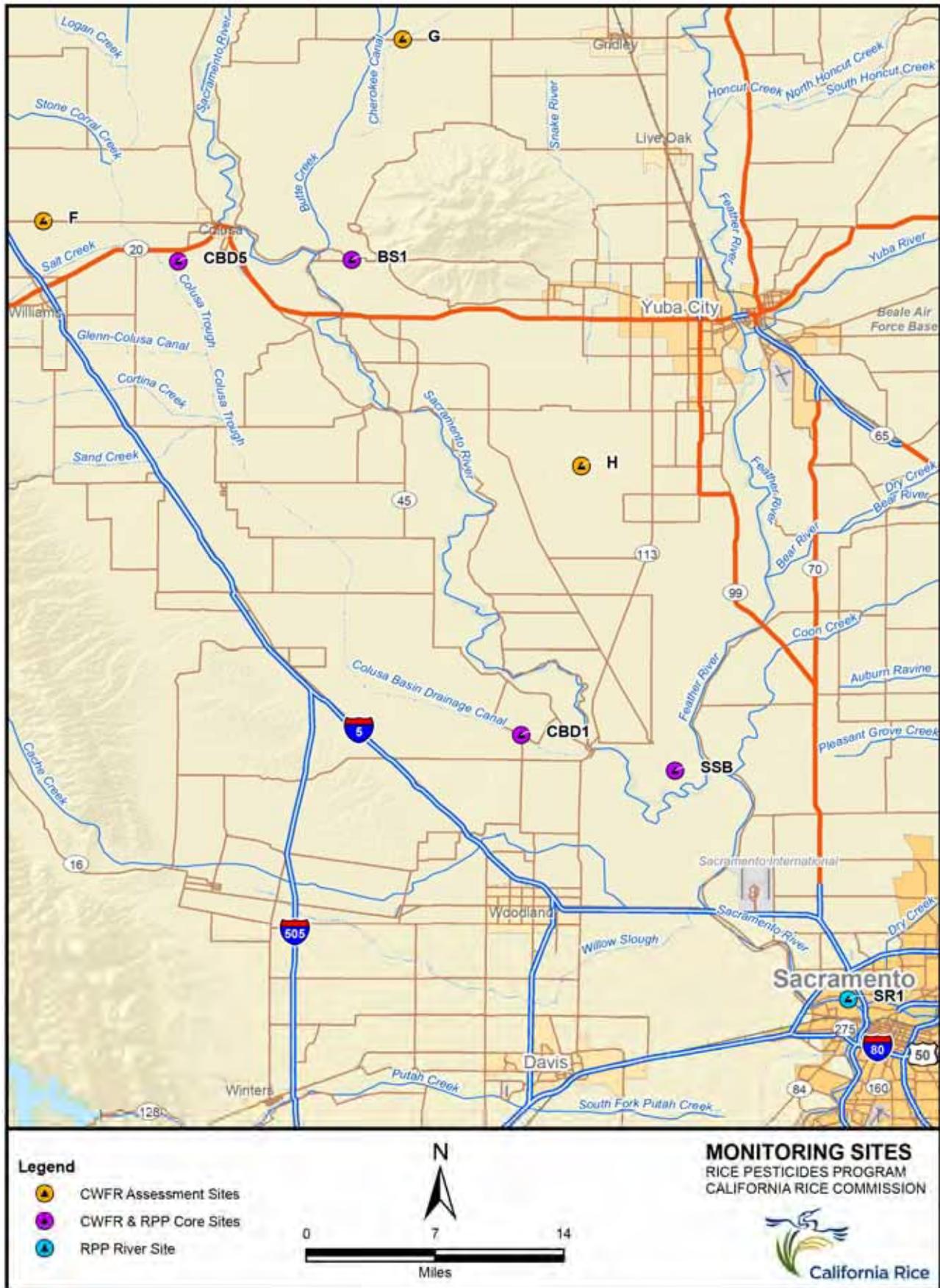
²⁶ The Rice Pesticides Program is a separate program from the Irrigated Lands Regulatory Program and has its own monitoring and reporting requirements.

²⁷ The report, *Basis for Water Quality Monitoring Program* includes a detailed description of the watersheds, the rice acreage in each watershed, and the drainages that transfer rice field discharges into the watershed. The monitoring data from the Rice Pesticides Program, which initially monitored approximately sixty sampling sites between Redding and the Delta, were analyzed with additional DPR monitoring data from locations in the study area. Detections of the rice pesticides were graphed by date (year) and concentration for each sampling site. Detections were examined for timing and location. The four primary sites showed detections when material was present in the watershed system and were considered representative of rice fields in the watershed.

Since 2004, the primary sites have been monitored every year of the ILRP. MRP Order R5-2010-0805²⁸ requires secondary sites upstream of the primary sites to be monitored on a rotating basis to ensure the primary sites remain representative of rice field discharges and also to help identify the location of any exceedances of water quality objectives.

²⁸ MRP Order R5-2010-0805 was in effect from the 2010 to 2012 rice growing seasons. An extension of the Order thru the 2013 growing season was approved by the Executive Officer on 29 December 2012.

Figure 4: CRC Surface Water Monitoring Sites



B. Past Surface Water Monitoring Results

In May 2012, the CRC submitted to the Central Valley Water Board a draft Surface Water Assessment Report (SAR) that summarizes and assesses all readily available water quality information²⁹ associated with rice growing operations in the Sacramento Valley. The SAR included recommendations for surface water monitoring parameters and schedules for this Order.

Although it may vary from year to year, the timing for the start of rice field operations and the type of operations are fairly consistent for the year. Start of field operations may vary about a month from north to south in the Sacramento Valley. The application of a specific pesticide generally occurs within a period of a few weeks for the majority of users. As such, monitoring for specific pesticides during application and release provides a good indicator of whether growers in that representative drainage are meeting applicable requirements.

Table 3 lists all constituents monitored to date. Table 4 contains a partial list of the constituents monitored from 2009 to 2012. Pursuant to the ILRP's MRP, the CRC monitored for pesticides used by Growers and general parameters including pH, flow, temperature, dissolved oxygen (DO), total dissolved solids (TDS), electrical conductivity (EC), and turbidity. Metals³⁰ were monitored in 2006 and generally found not to be a problem. Copper and hardness have been analyzed since 2006 at specific sites due to the amount of copper applied and as part of the Management Plan for toxicity to *Selenastrum capricornutum* (algae). Nutrient analyses were conducted in 2009 and 2012. Aquatic toxicity testing³¹ for *Selenastrum capricornutum*, *Ceriodaphnia dubia* and *Pimephales promelas* were conducted from 2004 to 2009 and in 2012. Sediment toxicity tests with *Hyalella azteca* were performed at least once per season during pre-harvest drainage from 2005 to 2007, and in 2009 and 2012.

²⁹ Readily available information includes, but is not limited to, published monitoring data, reports and studies from the US Geological Surveys, University of California Cooperative Extension, the Rice Research Board, and State Water Resources Control Board, as well as previous monitoring data performed for the ILRP.

³⁰ Metals analyzed included cadmium, copper, lead, nickel, zinc, selenium, arsenic and boron. Hardness was measured with metals.

³¹ Short-term chronic toxicity testing was performed for *Selenastrum*, and acute toxicity testing was performed for *Ceriodaphnia* and *Pimephales*.

Table 3: Constituents Monitored in Surface Water (previous MRPs)

Constituent	
General physical parameter	
Flow	Hardness
pH	Total dissolved solids
Electrical conductivity	Turbidity
Dissolved oxygen	Total organic carbon (TOC)
Temperature	
Nutrient Analysis	
Total Kjeldahl nitrogen	Unionized ammonia (calculated)
Nitrate – nitrite, as N	Total phosphorous as P
Total ammonia	Soluble orthophosphate
Water column toxicity	
Selenastrum capricornutum	
Ceriodaphnia dubia	
Pimephales promelas	
Photo monitoring (digital)	
Metals	
Arsenic	Lead
Boron	Nickel
Cadmium	Selenium
Copper	Zinc
Pesticides ³²	
Sediment toxicity	
Hyaella azteca	
Sediment TOC	
Pesticides in sediment ³³	
Lambda cyhalothrin	
S-cypermethrin	

³² The following pesticides were sampled: lambda cyhalothrin and (s) cypermethrin (2005 season); carfentrazone ethyl and bispyribac sodium (2006 season); cyhalofop butyl, azoxystrobin, and propiconazole/trifloxystrobin (2007 season); clomazone and triclopyr (2012 season).

³³ To be analyzed only if sediment toxicity found.

Table 4: Monitoring Result Summary for ILRP Monitoring from 2009 to 2012^a

	# of results for each parameter				Total # of results
	2009 (6 events, 7 sites)	2010 (4 events, 7 sites))	2011 (4 events, 4 sites)	2012 (5 events, 4 sites)	
General Parameters					
pH (units) (# of exceedances ^b /range)	45 (0/7.22-8.05)	23 (0/7.44-8.03)	18 (1/4.5-8.13)	20 (0/7.37-8.31)	106
Electrical conductivity (µmhos/cm) (range)	45 (128-667)	23 (171-768)	18 (152-761)	20 (233-695)	106
Dissolved oxygen (mg/L) (# of exceedances ^c /range)	45 (5/2.82-10.10)	23 (1/3.44-9.14)	18 (1/4.55-9.34)	20 (3/3.16-8.14)	106
Total dissolved solids (mg/L) (range)		15 (87-356)	16 (110-470)	20 (130-420)	51
Turbidity (NTU) (range)	42 (2.15-133.3)	21 (6.98-75.38)	18 (7.5-76.6)	20 (9.4-81.7)	101
Total organic carbon (mg/L) (range)		22 (1.9-10.0)	16 (3.9-19)	24 (2.7-11.0)	65
Nutrients					
Total Kjeldahl Nitrogen (TKN) (mg/L) (range)				8 (0.32-0.94)	8
Nitrate-nitrite as N (mg/L) (range)				8 (0.098-0.350)	8
Ammonia as N (mg/L) (range)				8 ((0.14-0.35)	8
Phosphorus as P (mg/L) (range)				8 (<0.15-0.28)	8
Toxicity					
(# samples/# significant toxicity ^d)					
Selenastrum	30/0			16/0	46
Ceriodaphnia	18/0			16/0	34
Pimephales	18/0			16/0	34
Hyaella	3/0			4/0	7
Metals					
Copper ^e , dissolved (µg/L) (# of exceedances ^f /range)	42 ^g (3/1.6-35)	14 (0/ND-9.0)	9 (0/1.0-5.0)	8 (0/1.4-7.0)	73
Pesticides^{h, i}					
Carfentrazone-ethyl (µg/L) (# of detections/range)	43 (0/ND)				43
Clomazone (µg/L) (# of detections/range)	43 (17/ND-4.0)			16 (9/ND-5.6)	59
Glyphosate (µg/L) (# of detections/range)	43 (0/ND)				43
Pendimethalin (µg/L) (# of detections/range)	43 (0/ND)				43
Penoxsulam (µg/L) (# of detections/range)	44 (0/ND)				44
Propanil ^l (µg/L) (# of detections/range)	38 (21/ND-27)	40 (15/ND-4.4)	40 (13/ND-6.5)		118
Triclopyr (µg/L) (# of detections/range)	9 (1/ND-0.71)			16 (6/ND-6.4)	25

^a The number of sampling results may not match due to duplicate samples and/or a reading was not taken due to dry conditions for field parameters. An exceedance (shown in parentheses) is based on the numerical water quality objectives for the parameter/constituent.

^b Defined as pH<6.5 or pH>8.5.

^c Defined as warm water objective, DO<5 mg/L

^d Toxicity is based on statistically significant reduction in population or survival compared to controls.

- ^e Hardness measured with copper analyses
- ^f Exceedance based on California Toxics Rule when copper is adjusted for hardness.
- ^g Total copper was analyzed rather than dissolved. Dissolved copper was analyzed in 2010 to 2012.
- ^h ND = Not detected based on lab's reporting limit for the pesticide. ND varied from 0.05 µg/L to 5.0 µg/L.
- ⁱ Pesticides monitored as part of the Algae Management Plan included clomazone, propanil, and triclopyr in 2009. The management plan was closed April 2010.
- ^j The voluntary Propanil Management Plan was triggered by the high result in 2009. Sampling under the management plan continued until closed February 2012.

Other than a high result for propanil, pesticides monitored to date have been found in concentrations below the level of concern based on relevant aquatic toxicity data and drinking water standards. The CRC voluntarily initiated a propanil management plan as discussed in Section VI.E. Management plans for *Selenastrum capricornutum* toxicity and DO and pH, initiated by two or exceedances in a three year period, are also discussed in Section VI.E.

C. Surface Water Monitoring Strategy

The surface water monitoring program is designed to assess whether materials applied to rice cause or contribute to identified surface water quality problems. This is assessed by measuring concentrations at times that materials would be expected to be present (shortly after application), and by measuring the toxicity to representative organisms of waters and sediments that might be affected by these materials.

The basic questions to be answered by the updated surface water quality monitoring program are similar to those established under the previous MRP Order (R5-2010-0805):

1. Are receiving waters to which rice lands discharge meeting applicable water quality objectives and Basin Plan provisions?
2. Are rice operations causing or contributing to identified water quality problems?³⁴ If so, what are the specific factors or practices causing or contributing to the identified problems?
3. Are water quality conditions changing over time (e.g., degrading or improving as new management practices are implemented)?
4. Are rice operations of Growers in compliance with the provisions of the Order?
5. Are implemented management practices effective in meeting applicable receiving water limitations?
6. Are the applicable surface water quality management plans effective in addressing identified water quality problems?

The questions are addressed through the following monitoring and information gathering approaches:

1. The monitoring sites cover representative sections of the rice lands in the Sacramento Valley. The requirement to evaluate materials applied to rice or constituents mobilized by rice operations will result in monitoring of those constituents in receiving waters.
2. The monitoring and evaluation approach required as part of the surface water quality monitoring and management plan development and implementation will address this question (see below and the requirements associated with surface water quality management plans).
3. Both "special project" monitoring associated with management plans and the monitoring conducted at monitoring sites should be sufficient to allow for the evaluation of trends. The requirements to gather information on management practices will provide additional information to help estimate whether any changes in trends may be associated with the implementation of practices.
4. The surface water monitoring required should allow for a determination as to whether discharges from rice lands are protective of beneficial uses and meeting water quality objectives. Other

³⁴ Water quality problem" is defined in Attachment E.

provisions in the MRP should result in the gathering of information that will allow the board to evaluate overall compliance with the Order.

5. The monitoring conducted as part of the implementation of a management plan, in addition to any special project monitoring required by the Executive Officer, should allow the board to determine whether management practices representative of those implemented by rice growers are effective. In addition, information developed through studies outside of these requirements can be used to evaluate effectiveness.
6. The “special project” monitoring associated with management plans will be tailored to the specific constituents of concern and the time period when they are impacting water quality. Therefore, the water quality data gathered, together with management practice information, should be sufficient to determine whether the management plans are effective.

The surface water monitoring required by this Order’s Monitoring and Reporting Program R5-2014-0032 (MRP) has been developed using the CRC’s 2010 MRP as a foundation. However, a number of changes were made to improve the cost-effectiveness of the surface water monitoring effort and ensure the data collected are the most appropriate for answering the monitoring questions.

The monitoring approach in this Order is based on three types of monitoring (Assessment, Modified Assessment, and Core Monitoring) performed on a five year rotation. Primary and secondary sites will be evaluated during Year 1 (Assessment Monitoring) and Year 2 (Modified Assessment Monitoring). Primary sites will be evaluated during Years 3-5 (Core Monitoring).

Assessment monitoring requires full comprehensive monitoring at the primary and secondary sites of the parameters listed in Table 3 of this Order’s MRP. For metals, only dissolved copper will be analyzed, since it is used in large quantities on rice fields as an algaecide and insecticide. No other metals have been detected from past monitoring, nor are they applied in any quantity on rice fields.

Based on past monitoring results (see above), rice pesticides pose a low risk of causing surface water quality problems. Therefore, this Order’s MRP requires monitoring of two pesticides in any given year to verify compliance with receiving water limitations. During the Assessment year, the Executive Officer may require monitoring of more than two pesticides if the Executive Officer determines that insufficient information is available to assess the potential threat to water quality of the pesticide or that available information suggests there could be a water quality threat associated with the pesticide³⁵. The two pesticides to be monitored during any given year will be based on the pesticide evaluation performed by the CRC and Central Valley Water Board staff. The pesticide monitoring schedule will be based on the time of application and release, the most vulnerable times for release to surface water, with two monitoring events per month required during the growing season. A minimum of two months (during and following peak application) of monitoring for each pesticide is required during Assessment and Modified Assessment years; one month (two sampling events within the month) of pesticide monitoring for each pesticide during peak application for those pesticides is required during Core years³⁶.

Past monitoring results also indicate there is a low risk of aquatic toxicity from rice operations. Therefore, toxicity tests are required during Assessment year monitoring only. Water column toxicity tests (*Selenastrum*, *Ceriodaphnia* and *Pimephales*) will be performed during the months when pesticides are monitored. Samples for sediment toxicity will be taken during the pre-harvest drainage period.

Core monitoring occurs at the primary sites, which have proven to be representative of rice discharges. Monitoring is twice a month for two “indicator” pesticides. Monitoring occurs during each indicator

³⁵ For example, a change in use patterns or practices make it more likely that the pesticide could be above water quality objectives or concentrations of the pesticide in surface waters could be increasing (a trend of degradation).

³⁶ For example, during a given Core year, pesticide X may have peak application during May and pesticide Y may have peak application in June. Two sampling events for pesticide X would occur in May and two sampling events for pesticide Y would occur in June.

pesticides' peak use period. The "indicator" pesticides will be determined by its wide use in rice fields. This monitoring will be used as an indicator that management practices, such as drift minimization, water-holding-times, and levee compaction, are implemented and protective of water quality.

The Executive Officer may require the CRC to conduct additional monitoring to address exceedances of a parameter(s) and may revise MRP Order R5-2014-0032 as necessary to address water quality problems with potential contributions from rice operations.

D. Rice Pesticides Evaluation

The 2004 *Basis for Water Quality Monitoring Program* included an assessment to identify pesticides³⁷ for monitoring based on usage, acreage applied and physical/chemical properties of the pesticides when released into the environment.³⁸ This assessment process has continued in the ILRP using updated DPR data for the monitoring requirements in MRPs. Under the Order's MRP, monitoring for pesticides will be evaluated and assessed every 5-years to determine if modifications should be made due to changes such as, but not limited to, application method, pounds/acreage applied, or new products in the market.

Selection of pesticides to be monitored under this Order is based on an evaluation of previous years' monitoring results, changes in pesticide use and/or application, and assessment of the potential for affecting water quality using physical and chemical properties of the pesticides. A typical evaluation starts with a compilation of pesticides used in rice operations.

The evaluation for trends in pesticide use includes evaluation of reported use, or knowledge of potential drivers for change in use patterns. For example, clomazone and triclopyr were chosen for assessment monitoring in 2012 due to the expected increase in use from previous years with the reports of increased thiobencarb-resistance for sprangletop in rice fields.

The Order requires the Rice Pesticides Evaluation/update be submitted by 31 December 2014 and updated every 5 years thereafter. The Rice Pesticides Evaluation will consider factors, such as, chemical, physical, and use properties to determine risk to water quality. Published field dissipation and degradation rates are also taken into account for pesticides that have required hold times before release from the field. Another step in the evaluation examines the aquatic toxicity values for freshwater biota (ECOTOX data) and applicable human health risk values. The pesticides to be monitored will be based on the Rice Pesticide Evaluation and annual evaluations contained in the Annual Monitoring Report and shall be reviewed as part of a rice-specific process by Water Board staff that includes input from qualified scientists and coordination with the Department of Pesticide Regulation. Once the list is approved by the Executive Officer, the CRC shall monitor the list of pesticides in accordance with the terms and conditions of this MRP.

E. Previous Surface Water Management Plans

Under Conditional Waiver Order R5-2006-0053, surface water quality management plans (SQMPs) are required when there is an exceedance of a water quality objective or trigger limit³⁹ more than one time in a three year period. Only two SQMPs have been required (algae and dissolved oxygen/pH), with the CRC voluntarily submitting a third SQMP (propanil).

³⁷ Pesticides to be monitored may include environmentally stable degradates of the registered active ingredient. The evaluation factors applied to degradates will be the same as those applied to the registered active ingredient and will include consideration of the commercial availability of analytical methods to detect the degradate. Potential degradates to evaluate will be identified through Central Valley Water Board and third-party consultation with the Department of Pesticide Regulation.

³⁸ Evaluation of chemical and physical properties includes, but is not limited to, solubility in water; adsorption coefficient; degradation or dissipation rates in water, soil and field; and consideration of field hold times.

³⁹ Trigger limits are discussed below under "Water Quality Objectives."

Algae Toxicity Management Plan

A management plan was triggered for *Selenastrum capricornutum* (algae) toxicity at the primary sites in 2006. The initial toxicity identification evaluations (TIEs) performed in 2006 indicated the source of toxicity was a non-polar organic herbicide with a short half-life. Further tests performed for identification were inconclusive. The CRC submitted its Algae Toxicity Management Plan (AMP) in 2007 and proposed pesticides used by rice and non-rice crops be analyzed in conjunction with toxicity testing in an attempt to identify the toxicant and pinpoint the source. In addition, copper and hardness were analyzed with pesticide analyses to determine if the copper could be contributing to the toxicity.

In the 2008 season, surface water samples were collected for algae toxicity testing in March (Jack Slough [JS], a secondary site⁴⁰), June (JS, CBD1, CBD5, BS1, and SSB), July (CBD1), and September (BS1, CBD1, and CBD5) and analyzed for the following pesticides: atrazine, bensulfuron-methyl, bispyribac-sodium, carfentrazone, clomazone, diuron, glyphosate, halosulfuron, molinate, pendimethalin, penoxsulam, propanil, simazine, thiobencarb, and triclopyr. As part of the ILRP, four pesticides also registered for use on rice, azoxystrobin, cyhalofop-butyl, propiconazole and trifloxystrobin, were also analyzed. *Selenastrum* toxicity (when compared to the control) was observed in April (JS, BS1, CBD5, CBD1, and SSB), at all sites in May, at JS in June and September, and CBD5 in June. However, no apparent relationship between pesticide presence and algae toxicity was observed.

In the 2009 season, the ILRP required the following pesticides to be analyzed at primary and secondary sites (F, G, and H): carfentrazone-ethyl, clomazone, glyphosate, pendimethalin and penoxsulam. The AMP required monitoring of propanil, clomazone and triclopyr at the primary sites. *Selenastrum* toxicity was observed in April (G) and in May (CBD1 and SSB). Again, no apparent relationship between pesticide presence and algae toxicity was observed. In fact, when algae toxicity was observed, detected pesticide concentrations were lower than on days with higher algae growth.

In accordance with the AMP, resampling at the site was required for any *Selenastrum* toxicity test with an observed toxicity reduction of 50% or more. Resampling, when triggered, showed no persistent toxicity.

During this time period an additional complicating factor in the *Selenastrum* toxicity test procedure being used by the toxicity laboratories throughout the ILRP was identified by staff. This led to a requirement in MRP Order R5-2010-0805, Attachment C, prohibiting the use of ethylenediaminetetraacetic acid (EDTA) in the *Selenastrum* toxicity tests. This prohibition ensured *Selenastrum* toxicity testing was performed consistently by all labs⁴¹.

In April 2010, the Algae Toxicity Management Plan was deemed complete and closed after two years of monitoring could not identify the toxicant or confirm that the source was from rice field discharges. Water column toxicity testing in 2012 for *Selenastrum* at primary sites showed no significant reduction in growth.

DO and pH Management Plan

In addition to algae toxicity, management plans were triggered for dissolved oxygen (DO) and pH. The DO and pH Management Plan was submitted to the Central Valley Water Board staff in December 2007, but deemed a low priority. DO and pH are affected by many physical and chemical factors, including flow, nutrient levels, water temperature, and weather. Central Valley Water Board staff will work with the Technical Issues Committee and CRC to identify next steps to address any continuing exceedances of the applicable DO and pH objectives.

Propanil Management Plan

In the 2008 Annual Monitoring Report, the CRC reported propanil monitoring by the registrant at CRC monitoring sites from 2006 to 2008. In 2009, a propanil concentration of 47 µg/L was found at Lurline

⁴⁰ Jack Slough was later dropped as a monitoring site due to inadequate flow.

⁴¹ The EPA guidance for *Selenastrum* toxicity testing allows the test to be performed with or without the addition of EDTA. EDTA is a chelating agent used to remove metals from the sample water.

Creek (site F) exceeding the trigger limit of 19-26 µg/L.⁴² This exceedance did not trigger a management plan, which requires two exceedances in a three year period. The CRC voluntarily submitted a Propanil Management Plan for the 2010 season that included monitoring at the primary sites and Lurline Creek during periods when propanil would be applied and released from rice fields. The Propanil Management Plan included the following actions to implement additional outreach, education and communication to propanil stakeholders:

- coordinate with the registrants on a combined meeting with the California Association of Pest Control Advisors (CAPCA), the California Agricultural Aircraft Association (CAAA), Pest Control Operators of California (PCOC) and county agricultural commissioners (CACs)
- provide propanil use information in the CRC newsletter and grower letter
- include links to regulation and permit conditions on the CRC website
- coordination with the registrants on the development of a brochure mailed to all CRC coalition members – the brochure is brought to the front page of the CRC website during the propanil use season

For the 2010 season, the highest propanil concentration detected was 10 µg/L at Lurline Creek, with all other sites reporting results less than 5 µg/L. The highest propanil concentration observed for the 2011 season was 6.5 µg/L, thereby indicating that the CRC's efforts were successful in ensuring that propanil did not exceed applicable trigger limits.

On 3 February 2012, the CRC requested termination of the Propanil Management Plan, stating the outreach efforts initiated under the plan would continue. The Executive Officer gave approval to terminate on 9 March 2012.

1. Surface Water Quality Management Plans

Similar to the previous Order (Coalition Group Conditional Waiver), this Order requires the CRC to develop a surface water quality management plan (SQMP) for areas where there is more than one exceedance of a water quality objective or trigger limit within a three-year period. SQMPs may also be required where there is a trend of degradation that threatens a beneficial use. SQMPs will only be required for wastes that may be discharged by some or all rice lands in the area. SQMPs are the key mechanism under the Order to help ensure that waste discharges from rice lands are meeting Surface Water Limitation III.A.1 of the Order. The limitations apply immediately unless the Grower is implementing management practices consistent with an approved Surface Water Quality Management Plan (SQMP) for a specified waste parameter in accordance with the approved time schedule authorized pursuant to section XII of this Order. The SQMP will include a schedule and milestones for the implementation of management practices (see Appendix MRP-1). The schedule must identify the time needed to identify new management practices necessary to meet the receiving water limitations, as well as a timetable for implementation of identified management practices. The SQMP will include a schedule for implementing practices that are known to be effective in protecting surface water quality. The SQMP must also identify an approach for determining the effectiveness of the implemented management practices in protecting surface water quality.

The SQMPs are work plans describing how the CRC will assist their Growers in addressing the identified water quality problem; the types of actions Growers will take to address the identified water quality problem; how the CRC will conduct evaluations of effectiveness of implemented practices; and document consistency with Time Schedule for Compliance (Section XII of the Order). Executive Officer approval indicates concurrence that the SQMP is consistent with the waste discharge requirements and that the proper implementation of the identified practices (or equivalently effective practices) should result in addressing the water quality problem that triggered the preparation of the SQMP. Approval also indicates concurrence that any proposed schedules or interim milestones are consistent with the requirements in section XII of the Order. If the Executive Officer is assured that

⁴² The range for the trigger limit is based on toxicity reduction of population growth for different species of algae.
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the growers in the area are taking appropriate action to come into compliance with the receiving water limitations (as described in the SQMP), the growers will be considered in compliance with those limitations. Approval of SQMPs does not establish additional waste discharge requirements or compliance time schedule obligations not already required by these waste discharge requirements. Instead, the Executive Officer is approving a method for determining compliance with the receiving water limitations in the affected area. See *Russian River Watershed Committee v. City of Santa Rosa* (9th Cir. 1998) 142 F.3d 1136; *CASA v. City of Vacaville* (2012) 208 Cal.App.4th 1438.

The main elements of SQMPs are to A) investigate potential rice sources of waste discharge to surface water; B) review physical setting information for the plan area such as existing water quality data; C) considering elements A and B, develop a strategy with schedule and milestones to implement practices to ensure discharge from rice discharges are meeting Surface Water Limitation III.A.1; D) develop a monitoring strategy to provide feedback on SQMP progress; E) develop methods to evaluate data collected under the SQMP; and F) provide reports to the Central Valley Water Board on progress.

Elements A – F are necessary to establish a process by which the CRC and Central Valley Water Board are able to investigate waste sources and the important physical factors in the plan area that may impact management decisions (elements A and B), implement a process to ensure effective practices are adopted by Growers (element C), ensure that adequate feedback monitoring is conducted to allow for evaluation of SQMP effectiveness (elements D and E), and facilitate efficient board review of data collected on the progress of the SQMP (element F).

The SQMPs required by this Order require the CRC to include the above elements. SQMPs will be reviewed and approved by the Executive Officer. Also, because SQMPs may cover broad areas potentially impacting multiple surface water users in the plan area, these plans will be circulated for public review. Prior to plan approval, the Central Valley Water Board Executive Officer will consider public comments on proposed SQMPs.

The burden of SQMP, including costs, is reasonable, since 1) the monitoring and planning costs are significantly lower, when undertaken regionally by the CRC, than requiring individuals to undertake similar monitoring and planning efforts, and 2) the Central Valley Water Board must be informed of the efforts being undertaken by irrigated agricultural operations to address identified surface water quality problems. A regional SQMP is, therefore, a reasonable approach to address identified surface water quality problems

However, if the regional SQMP does not result in the necessary improvements to water quality, the burden, including costs, of requiring individual Growers in the impacted area to conduct individual monitoring, describe their plans for addressing the identified problems, and evaluate their practices, is a reasonable subsequent step. The benefits and necessity of such individual reporting, when regional efforts fail, include, but are not limited to: 1) the need of the board to evaluate the compliance of regulated growers with applicable orders; 2) the need of the board to understand the effectiveness of practices being implemented by regulated growers; and 3) the benefits to all users of that surface water of improved water quality.

VI. Groundwater Monitoring and Quality

A. Groundwater Monitoring Advisory Workgroup

The Groundwater Monitoring Advisory Workgroup (GMAW), consists of groundwater experts representing state agencies, the United States Environmental Protection Agency (USEPA), the United States Geological Survey (USGS), academia, and private consultants. The following questions were

identified by the GMAW and Central Valley Water Board staff as critical questions to be answered by groundwater monitoring conducted to comply with the ILRP.⁴³

1. What are irrigated agriculture's impacts to the beneficial uses of groundwater and where has groundwater been degraded or polluted by irrigated agricultural operations (horizontal and vertical extent)?
2. Which irrigated agricultural management practices are protective of groundwater quality and to what extent is that determination affected by site conditions (e.g., depth to groundwater, soil type, and recharge)?
3. To what extent can irrigated agriculture's impact on groundwater quality be differentiated from other potential sources of impact (e.g., nutrients from septic tanks or dairies)?
4. What are the trends in groundwater quality beneath irrigated agricultural areas (getting better or worse) and how can we differentiate between ongoing impact, residual impact (vadose zone) or legacy contamination?
5. What properties (soil type, depth to groundwater, infiltration/recharge rate, denitrification/nitrification, fertilizer and pesticide application rates, preferential pathways through the vadose zone [including well seals, abandoned or standby wells], contaminant partitioning and mobility [solubility constants]) are the most important factors resulting in degradation of groundwater quality due to irrigated agricultural operations?
6. What are the transport mechanisms by which irrigated agricultural operations impact deeper groundwater systems? At what rate is this impact occurring and are there measures that can be taken to limit or prevent further degradation of deeper groundwater while we're identifying management practices that are protective of groundwater?
7. How can we confirm that management practices implemented to improve groundwater quality are effective?

The workgroup members reached consensus that the most important constituents of concern related to agriculture's impacts to the beneficial uses of groundwater are nitrate (NO₃-N) and salinity. In addition to addressing the widespread nitrate problems, the presence of nitrates in groundwater at elevated levels would serve as an indicator of other potential problems associated with irrigated agricultural practices. Central Valley Water Board staff utilized the recommended salinity and nitrate parameters and added general water quality parameters contained within a majority of the groundwater monitoring programs administered by the board (commonly measured in the field) and some general minerals that may be mobilized by agricultural operations (general minerals to be analyzed once every five years in Trend wells). The general water quality parameters will help in the interpretation of results and ensure that representative samples are collected. The board considered the above questions in developing the Order's groundwater quality monitoring and management practices assessment and evaluation requirements.

B. Description of Sacramento Valley Groundwater Basins

The California Department of Water Resources (DWR) has defined the groundwater basins and major hydrologic features within the Sacramento Valley (Figure 5). The Sacramento Valley groundwater basin is further divided into the north, the middle and the southern Sacramento study units under the joint State Water Resources Control Board (State Water Board) and USGS Groundwater Ambient Monitoring

⁴³ Groundwater Monitoring Data Needs for the ILRP (25 August 2011). Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/new_waste_discharge_requirements/stakeholder_advisory_workgroup/2011sept30_advrsy_wkgrp_mtg/gmaw_25aug_data_needs.pdf

Assessment (GAMA) Program (Figure 6). Rice lands are contained in the middle and southern sections of the Sacramento Valley groundwater basin, with the majority of rice planted in the middle section.

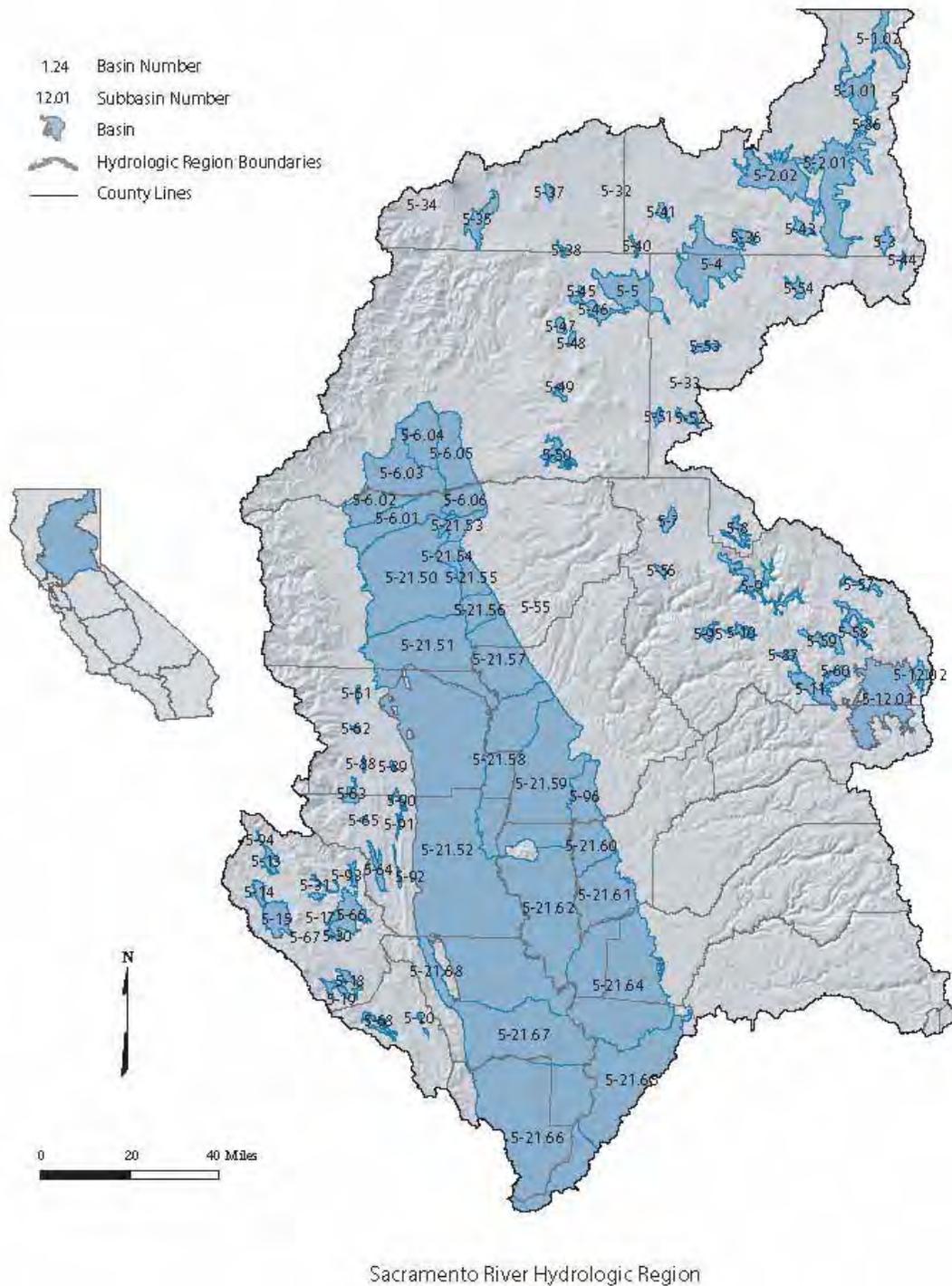
The Sacramento Valley overlies one of the largest groundwater basins in the state, providing high quality water for irrigation, municipal, industrial and domestic uses. DWR divides the Sacramento Valley groundwater basin into 17 subdivisions based on ground water characteristics, surface water features, and political boundaries. The Sacramento River and its tributaries do not act as barriers to groundwater flow. The individual groundwater sub-basins have a high degree of hydraulic interconnection and are not discrete isolated groundwater sub-basins.

Groundwater generally flows from the edges of the basin toward the Sacramento River, then in a southerly direction parallel to the Sacramento River. Depth to groundwater throughout most of the Sacramento Valley is 30 feet below ground surface (bgs), with shallower depths along the Sacramento River and greater depths along the basin margins. Seasonal fluctuations occur due to recharge through precipitation and snowmelt runoff, associated fluctuations in river stages, and the pumping of groundwater to supply agricultural, municipal and domestic demands.

In the past, Sacramento Valley surface water supplies have been abundant and groundwater was used as a supplement for agricultural irrigation. With the changes in environmental requirements and the lack of precipitation in the area, greater reliance on groundwater and conjunctive management of both surface and groundwater supplies is occurring to a greater extent throughout the Sacramento Valley. Many valley towns and cities rely on groundwater for all or a portion of their municipal supply needs. Domestic use of groundwater varies, but rural unincorporated areas generally rely completely on groundwater.

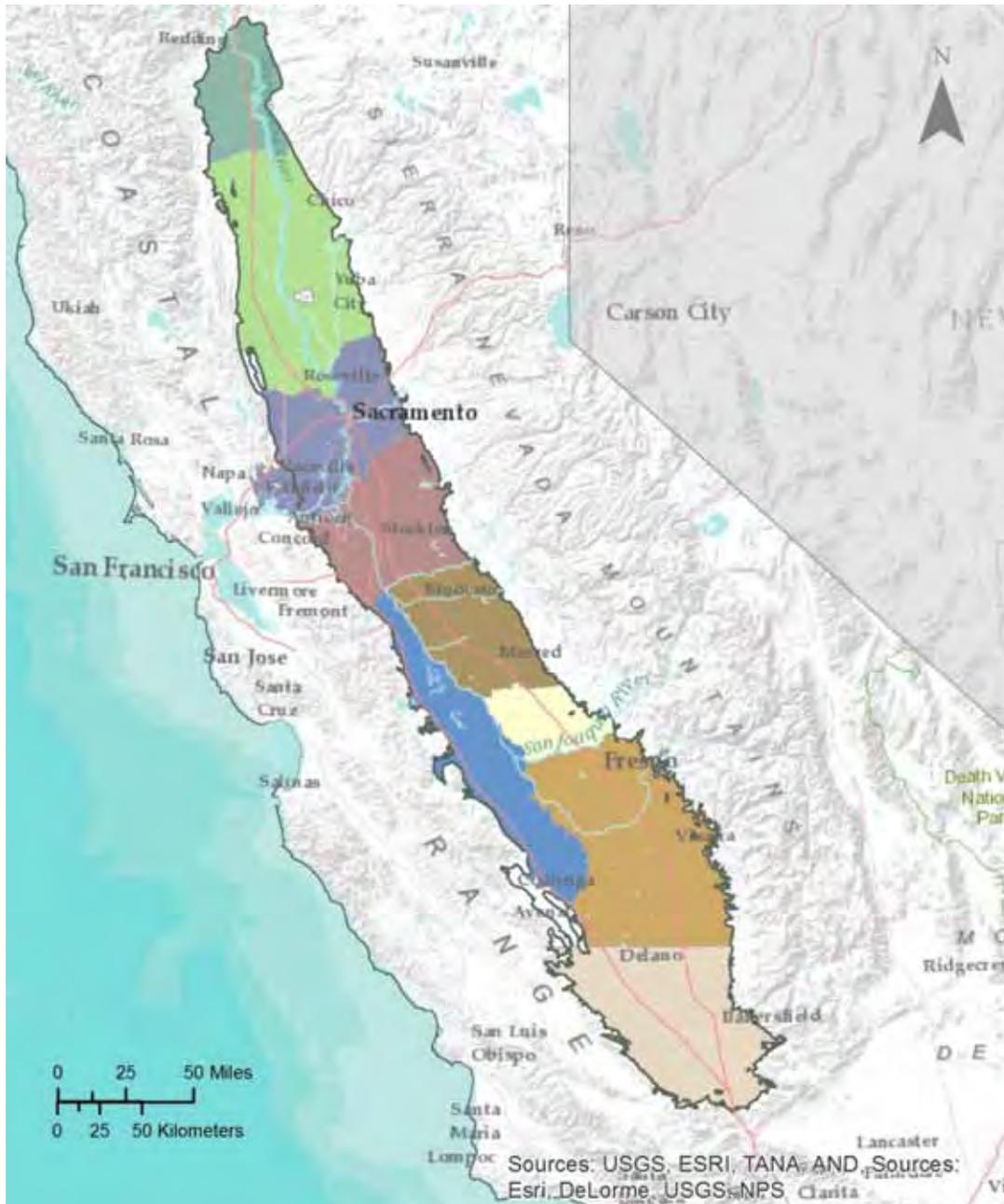
More detailed information on geology, soils, hydrogeology and groundwater can be found in the GAR.

Figure 5: Sacramento Valley Groundwater Basin⁴⁴



⁴⁴ From DWR website, map of Sacramento River Groundwater Sub-basin
http://www.water.ca.gov/groundwater/bulletin118/gwbasin_maps_descriptions.cfm

Figure 6: Sacramento Valley and San Joaquin Valley GAMA Study Units⁴⁵



The Central Valley Province consists of the following basins or study areas:

- Northern Sacramento Valley
- Central Sacramento Valley
- Southern Sacramento Valley
- Northern San Joaquin Basin
- Western San Joaquin Basin
- Central Eastside San Joaquin Valley
- Madera-Chowchilla
- Southeast San Joaquin Valley
- Kern

⁴⁵ Figure and captions from website <http://ca.water.usgs.gov/gama/Provs/CenVly.htm>
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C. Groundwater Assessment Report for Rice Fields in the Sacramento Valley

In April 2012, the CRC submitted a draft *Rice-Specific Groundwater Assessment Report* (GAR) for rice growing areas in the Sacramento Valley. A final GAR was submitted 2 August 2013 based on staff comments and is available to the public as part of this Order.

The analysis presented in the GAR integrates information and data, including soils, hydrogeology, irrigation practices, and groundwater monitoring data, to evaluate rice areas that may have, or have the potential, to impact groundwater quality. Figure 7 shows the data assimilation process for this analysis. The data was ultimately used to develop a rice-specific Conceptual Site Model (CSM) that describes and helps with the interpretation of the physical processes in rice growing systems (see Figure 8). The CSM is a framework for analyzing data related to subsurface hydrology and pollutant transport. The CSM helps describe the connections of rice fields to the broader environment. Independent lines of evidence were developed to assess risk of groundwater quality degradation by rice farming.

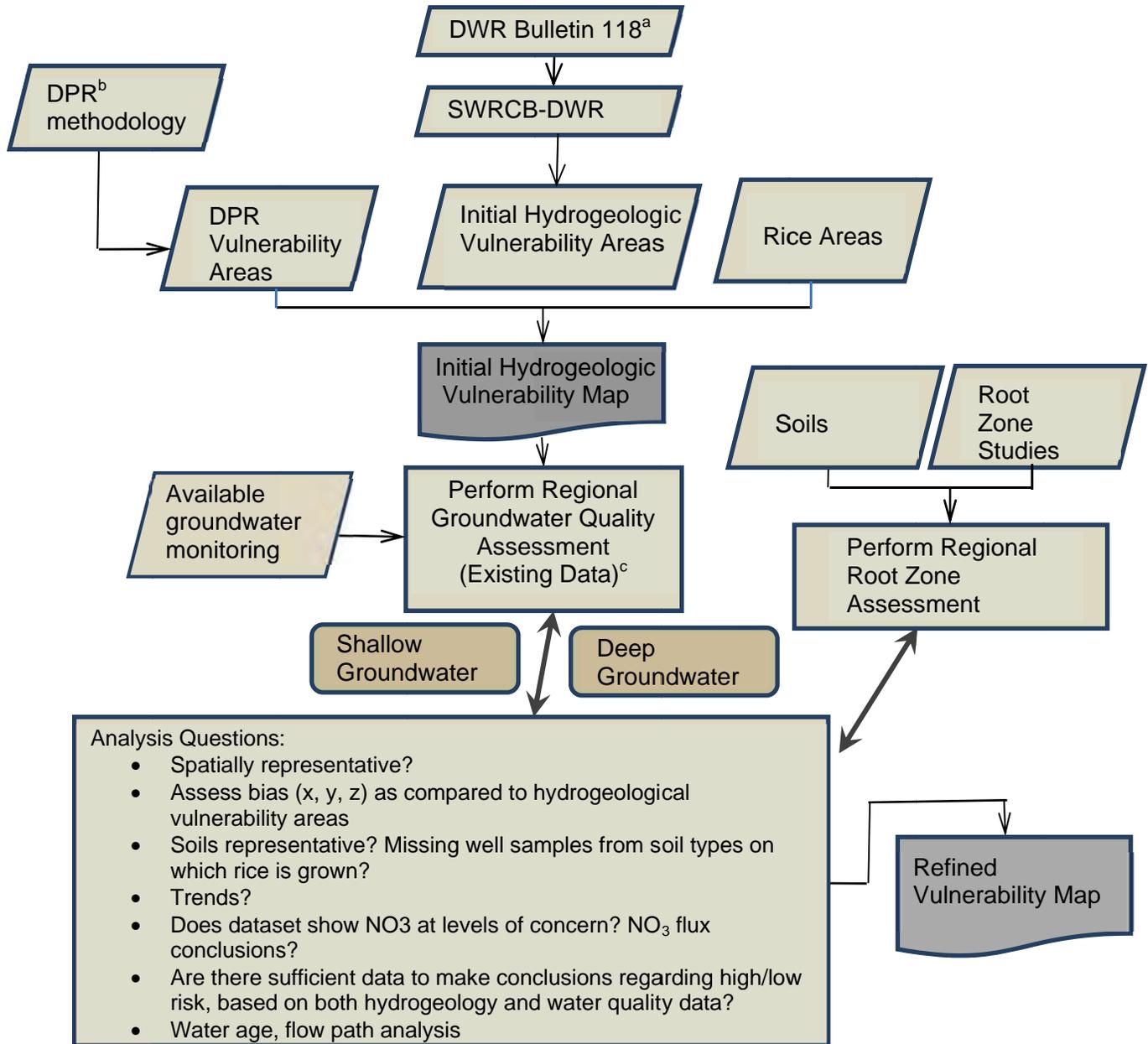
Figure 9 shows the State Water Board's initial high vulnerability areas⁴⁶ (HVAs) and the DPR Groundwater Protection Areas⁴⁷ (GPA), and rice lands within the HVAs and GPAs, respectively. A GIS analysis was used to calculate the acres of rice lands located in the initial HVAs and the GPAs (Figure 10). Using rice land use data, the CRC estimated that about 48,200 acres of rice lands are located in the initial HVAs. It was also estimated that about 1,900 acres of rice lands are located in DPR leaching areas and 56 acres in DPR leaching or runoff GPAs.

Due to the types of soil in rice fields (high clay and loam content with low permeability), the closely managed method of nitrogen application (liquid injection into the soil and immediate flooding), and the dynamics of nitrogen in flooded soils, the GAR found that groundwater in the rice region is generally of low vulnerability to contamination from rice farming. In regions farmed continuously to rice for decades, shallow groundwater is generally of high quality, showing low levels of nitrate and salinity. Soil conditions in rice fields do not favor transport of nitrate to groundwater, and irrigation and drainage water are generally less saline than in other areas of the Central Valley. Rice farming has thus been shown to be a weak source of groundwater contaminants, and there are no known high vulnerability areas (to shallow groundwater pollution from rice farming) in the CRC Coalition area.

⁴⁶ The initial HVA map was created in 2000 by the State Water Board in GIS format to support groundwater vulnerability assessment. The initial HVA map is based on hydrogeologic information.

⁴⁷ DPR GPAs identifies leaching, runoff, and leaching or runoff conditions based on soil types.

Figure 7: Data Assimilation and Interpretation Process

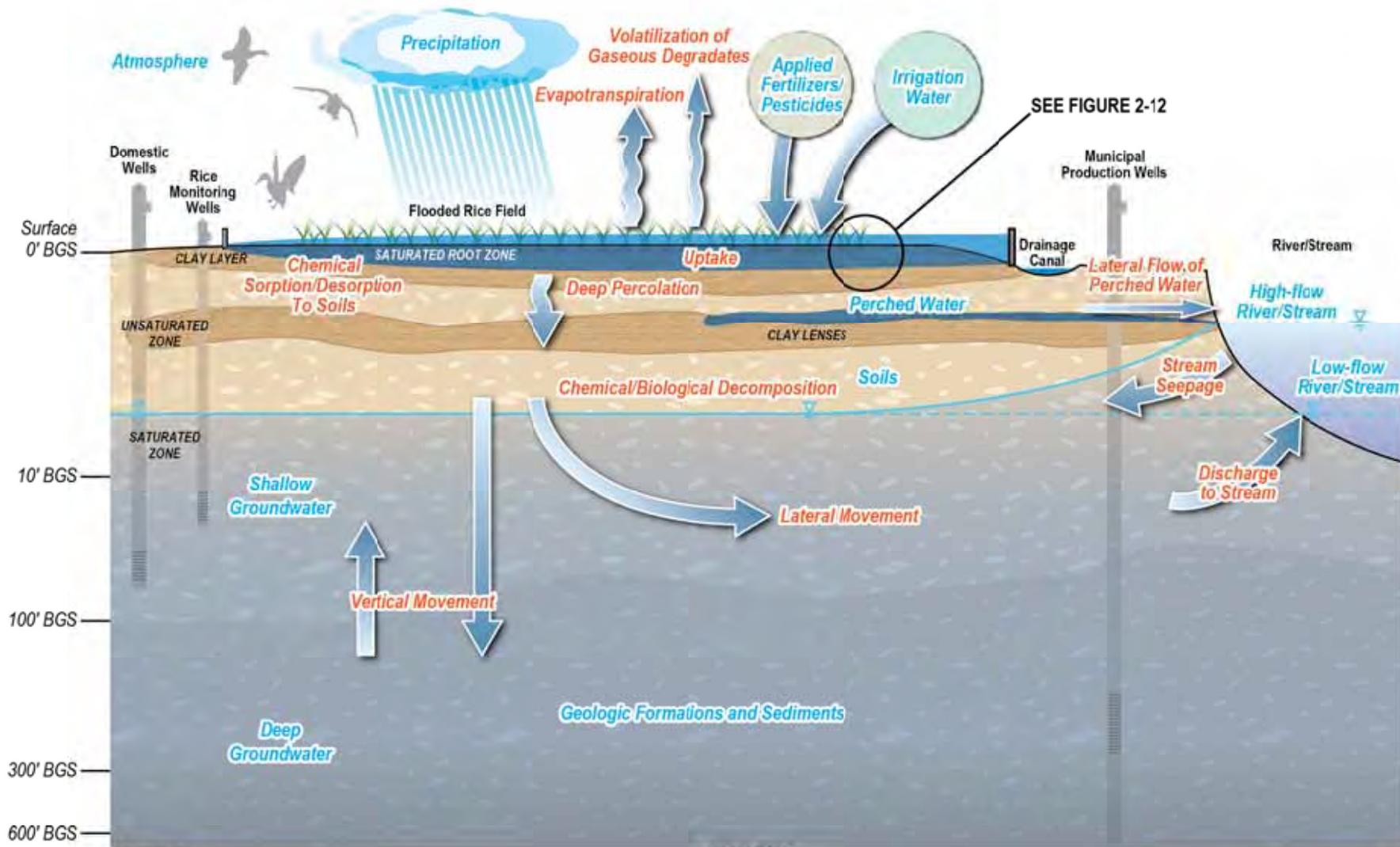


^a California Department of Water Resources. *California's Groundwater*, 1978. Bulletin 118. Latest update 2003.

^b Troiano, J, B. Johnson, S. Powell, and S. Schoenig, 1992. Profiling Areas Vulnerable to Ground Water Contamination by Pesticides in California, EH 92-09.

^c Available groundwater monitoring data include studies such as the US Geological Survey (USGS) National Water Quality Assessment (NAWQA) Program; DPR Sampling for Pesticide Residues in California Well Water; and the California Groundwater Ambient Monitoring and Assessment (GAMA) Program sponsored by the California State Water Resources Control Board and the USGS.

Figure 8: Conceptual Site Model in Sacramento Valley Rice Fields



LEGEND

■ Pathways and Transformations

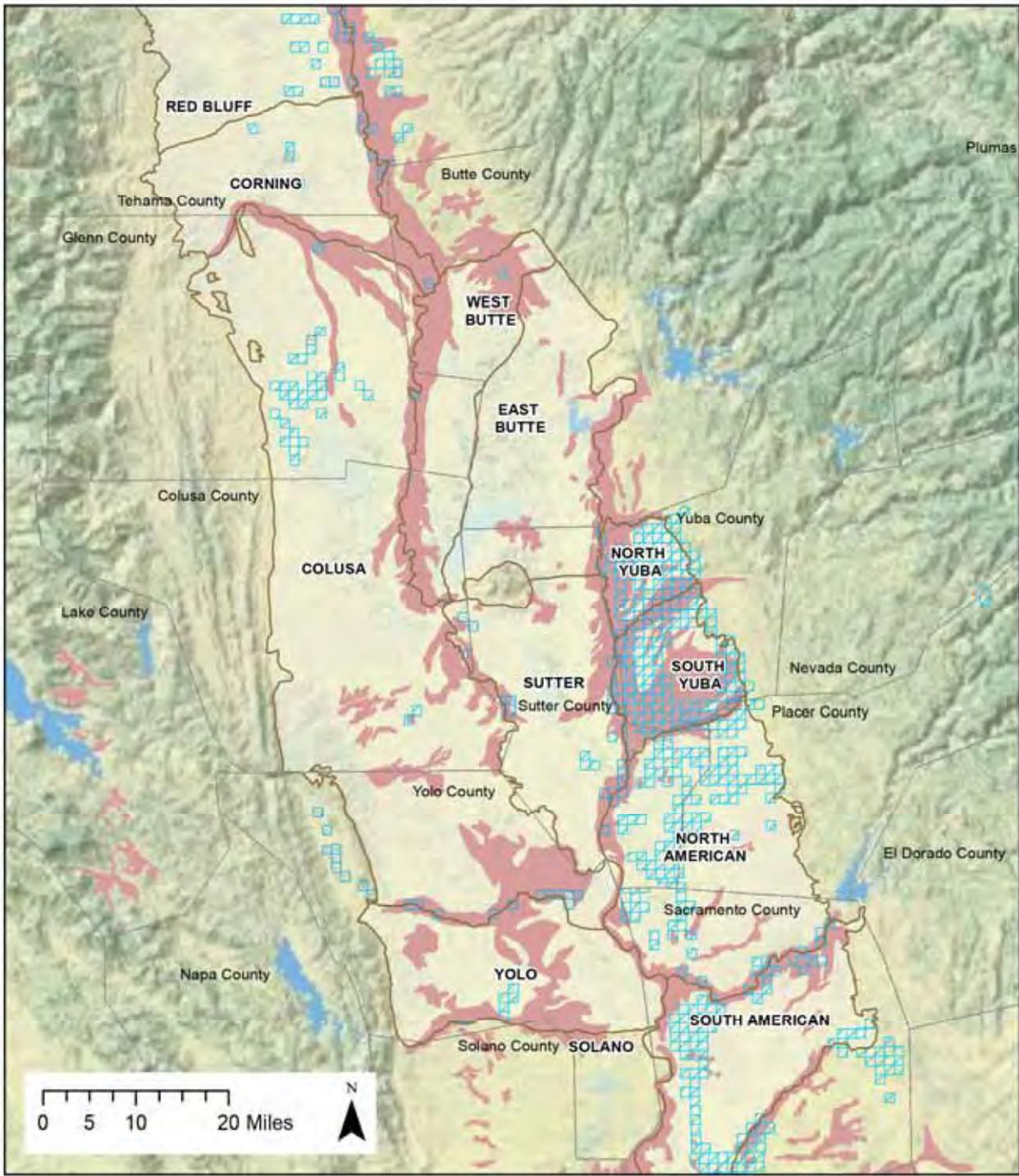
■ Sources and Sinks

The features on this diagram are intended to be broadly representative of physical and chemical conditions encountered in a typical rice field, and are not intended to represent exact conditions in every rice field.

Note: Figure from the Rice-Specific Groundwater Assessment Report, Figure 2-2.



Figure 9: State Water Board's HVAs and DPR GPAs



Data Sources: Groundwater Basins, Rice Crop (California DWR 2010); Basemap, County (ESRI 2011); SWRCB (2000); DPR (2004). Datum is NAD83.

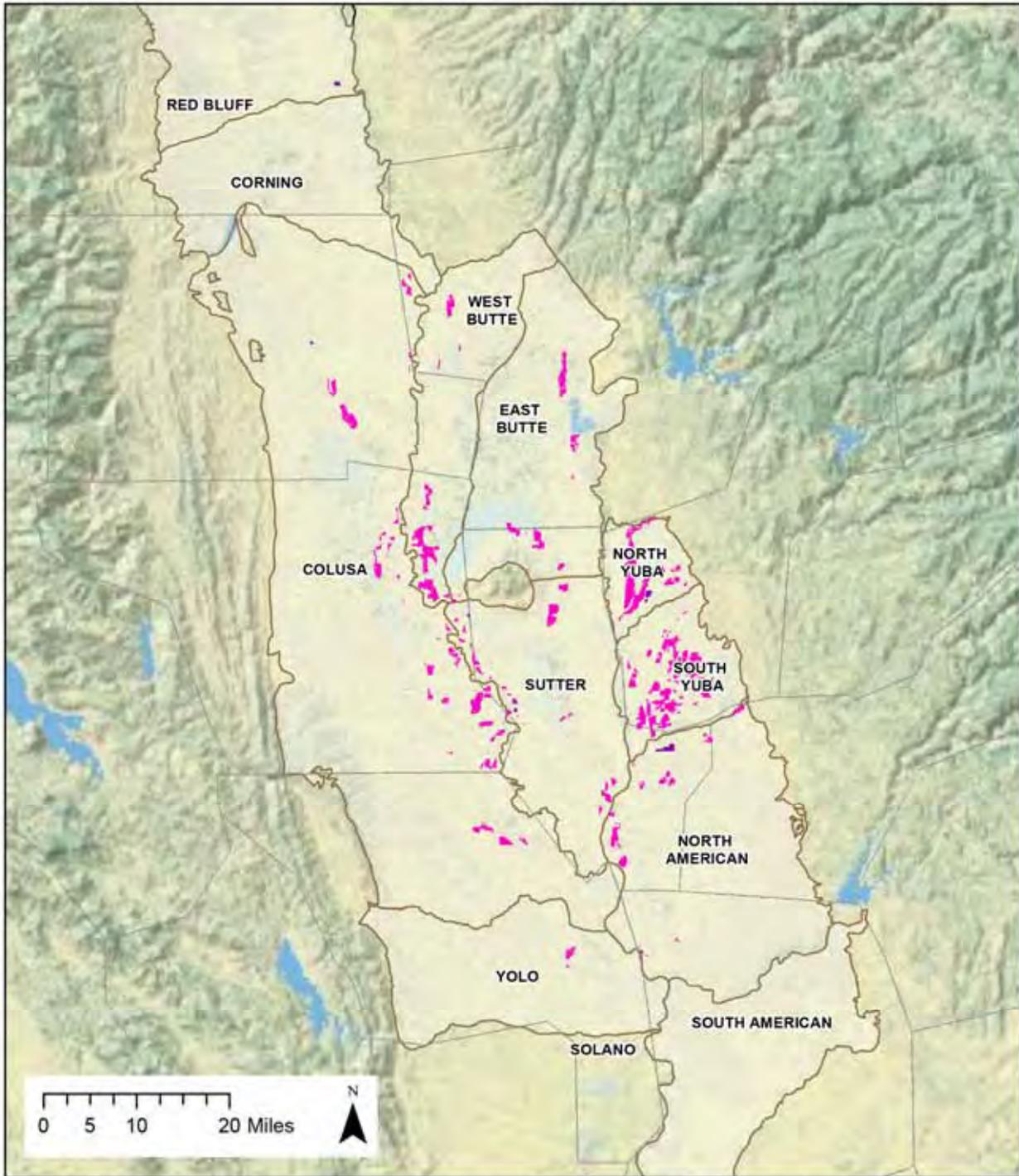
Legend

- SWRCB Initial HVA
- County Boundary
- DPR GPAs**
- Leaching
- Runoff
- Runoff or Leaching
- Groundwater Basins

Note: Figure from the Rice-Specific Groundwater Assessment Report, Map 2-15



Figure 10: Rice lands in State Water Board's HVAs and DPR GPAs



Data Sources: Groundwater Basins, Rice Crop (California DWR 2010); Basemap, County (ESRI 2011); SWRCB (2000); DPR (2004). Datum is NAD83.

Legend

- Rice within Initial SWRCB HVA
- Rice within DPR Leaching and Leaching or Runoff GPA
- County Boundary
- Groundwater Basins

Note: Figure from the Rice-Specific Groundwater Assessment Report, Map 2-16



The GAR identified an area, North Yuba and South Yuba groundwater sub-basins in Yuba County, with no or limited groundwater monitoring data from the reviewed datasets. Also, smaller areas comprised of varying soil classes were not represented by shallow wells, including northern Glenn County and Placer County. In these limited rice growing regions where available data were sparse, CRC will undertake additional data gap analysis and potential monitoring to better characterize the environment, and to confirm or potentially change the vulnerability findings in the GAR.

D. Past Groundwater Monitoring Results

In the GAR, the CRC examined monitoring data from the following well networks and programs:

1. **USGS Groundwater Ambient Monitoring and Assessment (GAMA) Program**
In 2005, the USGS started monitoring in the Sacramento Valley as part of the California Groundwater Ambient Monitoring and Assessment (GAMA) Program in cooperation with the State Water Board. The Sacramento Valley was divided into the Northern, Middle and Southern sub-regions, with the Middle and Southern sub-regions encompassing rice lands. Monitoring initially occurred in June-September 2006 for the Middle Sacramento Valley, and in March-June 2005 for the Southern Sacramento Valley. The GAMA Program continues to monitor certain wells from the original studies under the GAMA Priority Basin Project.⁴⁸
2. **California Department of Pesticide Regulation – Groundwater Protection Program**
The California Department of Pesticide Regulation (DPR), as part of its regulatory requirements under the Pesticide Contamination Prevention Act (PCPA), is required to maintain a statewide database of wells sampled for pesticide active ingredients. In consultation with the California Department of Public Health (CDPH) and the State Water Resources Control Board (State Water Board)⁴⁹, DPR annually reports the data and the actions taken to prevent pesticides contamination. DPR submits the reports to the Legislature and other State agencies.

DPR also initiated the Groundwater Protection Program, which focuses on evaluating the potential for pesticides to move to groundwater, improving contaminant transport modeling tools, and outreach/training programs for pesticide users. As part of the Groundwater Protection Program, DPR has delineated areas where groundwater is vulnerable to contamination due to soil conditions that may allow leaching of pesticides or runoff to unprotected wellheads or other conduits to groundwater. More detailed information on rice land soils found in this area is contained in the GAR (and Figure 10).

DPR evaluates and lists pesticides that have the potential to move to groundwater based on guidelines established in the Food & Agricultural Code § 13145(d). DPR will add restrictions to the use of the pesticides identified as known groundwater contaminants, and defined in the Food & Agricultural Code § 13149. Monitoring of pesticides both as known and potential groundwater contaminants can lead to mitigation with additional management practices either through permit conditions, or regulation. These pesticides are listed under Title 3 California Code of Regulation (CCR), Division 6, § 6800(b) (DPR's Ground Water Protection List or GWPL) indicating they have the potential to become contaminants based on their mobility, persistence and legal uses, which include certain characteristics as defined in the Food & Agricultural Code, § 13145(d). Pesticides currently applied to rice that are listed in § 6800(b) include azoxystrobin, bensulfuron methyl, bispyribac-sodium, carbaryl, clomazone, 2,4-D dimethylamine salt, halosulfuron-methyl, penoxsulam, propanil, thiobencarb, and triclopyr triethylamine salt. Of these pesticides, only bensulfuron methyl, clomazone, propanil and thiobencarb are used exclusively on rice.⁵⁰

⁴⁸ Bennett, G.L., Fram, M.S, and Belitz, K., 2011. Status of Groundwater Quality in the Southern, Middle, and Northern Sacramento Valley Study Units, 2005-2008: California GAMA Priority Basin Project, U.S. Geological Survey Scientific Investigations Report 2011-5002, 120 p.

⁴⁹ The State Water Board sampling results are from the GAMA Program with USGS.

⁵⁰ Date pesticide registered for use on rice: bensulfuron methyl (1989); clomazone (2003); propanil (1996); and thiobencarb (1983)

The DPR 2012 Update of the Well Inventory Database,⁵¹ lists results from sampling reported by DPR from 1984 through 2011. Detections of rice pesticides listed in the Groundwater protection List (GWPL) are shown in Table 5.

Table 5: GWPL Rice Pesticides Detected from 1984 to 2011 for All Reporting Agencies

	Counties Sampled/Positive Counties	Wells Sampled/Positive Wells	Historical Min-Max Concentration (ppb)	Years Monitored
Registered Pesticides and Degradates				
Azoxystrobin acid ^a	11/1	124/3	0.101-0.268	2010
Propanil ^b	29/2	736/2	0.006 – 0.097	2011
Thiobencarb	56/6	8,047/9	0.006-8.7	1985-1986, 1989, 1992-1993, 2002-2011
Triclopyr	36/1	806/1	0.12	2011
Inactive Pesticides				
Molinate ^c	55/9	8,160/19	0.002-29	1984-1986, 1989-1991, 1993, 2003, 2005-2011

^a Azoxystrobin acid, is a degradation product of azoxystrobin, a fungicide registered on multiple crops. DPR did not enter this degradation product into the PDRP because DPR determined that the detected concentrations did not pose a threat to public health. DPR Sampling for Pesticide Residues in California Well Water, March 2013.

^b A degradate, 3,4-dichloroaniline (DCA), was detected at several wells. 3,4-DCA is also a degradate of linuron, and diuron, pesticides not registered for rice.

^c Molinate registration was cancelled in 2008 with no use permitted after the 2009 growing season.

3. USGS Water-Resources Investigations Report 01-4000 USGS National Water-Quality Assessment (NAWQA) Program – Land Use Study⁵²
 The USGS installed 28 shallow monitoring wells in the Sacramento rice-growing areas in 1997 as part of the 1997 National Water Quality Assessment (NAWQA) Program. Of these wells, 23 wells are currently monitored annually for water levels. A subset of 5 wells is sampled every 2 years for water quality.

These wells were specifically located to be surrounded by at least 75% rice farmland within 500 meters at the time of installation. Because of crop rotation, some of the wells are surrounded by less than 50% rice land in some years. Seven wells are located in right-of-way areas next to rice fields; the rest are located adjacent to the rice fields along field roads or rice equipment areas, or in farm or home yards surrounded by rice fields. Well depth varies from 8.8 m to 15.2 m (29 to 50 feet) bgs.

Wells were initially sampled from August to October 1997. Results showed that eleven pesticides and one pesticide degradate were detected in groundwater samples. Four of the detected pesticides are or have been used on rice crops in the Sacramento Valley (bentazon, carbofuran, molinate, and thiobencarb). All pesticide concentrations, rice and non-rice, were below state and federal 2000

⁵¹ Updated with sampling results from 2011, dated March 2013.

⁵² Milby Dawson, B,J, 2001. *Shallow Ground-Water Quality Beneath Rice Areas in the Sacramento Valley, California, 1997*. USGS Water-Sources Investigations Report 01-4000, National Water-Quality Assessment Program, Water-Resources Investigations Report, 04-4000.

drinking water standards.⁵³ Results from further sampling performed since 1997 is described in detail in the GAR.

4. USGS National Water-Quality Assessment (NAWQA) Program – Sacramento Subunit Area⁵⁴
The NAWQA Sacramento subunit area, which comprises about 1,700 square miles and includes intense agricultural and urban development, was chosen for the program because it had the largest amount of groundwater use in the Sacramento Valley Groundwater Basin (SVGB). The objective of a study-unit survey was to assess the overall water quality in the aquifers that supply the highest amount of drinking water within the study basin. For this study, 29 shallow domestic and 2 monitoring wells were sampled. The data from this network provide additional information on groundwater quality in shallow groundwater in and around rice land use areas. These wells were sampled twice by the NAWQA program: once in 1996 and again in 2008. Results of these sampling events are found in the GAR.
5. Nitrates in Groundwater
The GAR examined three USGS studies for nitrate beneath rice lands: 1) the USGS study on shallow rice wells; 2) the USGS study under the NAWQA Program for 31 shallow domestic wells with nitrate data from 1996 and 2008; and 3) the USGS GAMA data for deep wells that has monitoring data from 1996 to 2008. The GAR summarized the data for each of these studies and located the wells that had nitrate (generally defined in the studies as nitrate + nitrite as N) concentrations above the MCL (10 mg/L) and 0.5 MCL (between 5 mg/L and 10 mg/L).

USGS Shallow Rice Wells

USGS currently samples the remaining network wells annually for water levels. A subset of 5 wells is sampled every 2 years for water quality. No wells showed nitrate concentrations above 10 mg/L for sampling performed from 1996 to 2011. During the same period, two wells had results over the 0.5 MCL.

The initial study analyzed for tritium, a radioactive isotope of hydrogen that can be used to estimate recharge rate for the groundwater. In 1997, the tritium analyses indicate that all but one of the USGS rice wells yield groundwater that was at least partially recharged since 1950. Based on the fact that rice acreage tripled from 1940 to 1950⁵⁵, these shallow groundwater samples can be considered representative of rice growing practices in the Sacramento Valley after the development and spread of irrigated rice cultivation in the Sacramento Valley.

USGS NAWQA Shallow Domestic Wells

The NAWQA study of shallow domestic wells has data from 1996 and 2008 for thirty wells. The 1996 sampling showed one well with nitrate detected greater than the MCL. Follow-up sampling at the same wells in May and July 2008 showed two wells with nitrate values over 10 mg/L, including the well previously found in 1996. These two wells are located in northeastern Sutter County, near Yuba City. These wells may capture some rice field discharges to groundwater, but other sources, non-rice agriculture and non-agriculture, are also likely contributing.

⁵³ Pesticides detected were atrazine, bromacil, carbofuran, desethyl atrazine, dichlorprop, diuron, azinphos-methyl, molinate, simazine, tebuthiuron, and thiobencarb. Bentazon had a maximum detection level (estimated) at 7.8 µg/L. All of the other pesticides had maximum detection levels below 1 µg/L.

⁵⁴ Dawson, B.J.M., 2001. *Ground-Water Quality in the Southeastern Sacramento Valley Aquifer, California, 1996*. U.S. Geological Survey Water-Resources Investigations Report 01-4125, 24 p.

⁵⁵ Rice acreage in California increased from about 100,000 acres in 1940 to over 300,000 acres in 1950 (US Census of Agriculture).

USGS GAMA Study

The USGS GAMA study used grid wells to statistically represent the study unit conditions and flow-path wells.⁵⁶ These wells were generally production wells with well depths ranging from 48 ft to 870 ft bls. The 2006 results for these deep wells showed 2 of 60 deep wells with nitrate concentration above the MCL and 6 wells with nitrate concentrations between half the MCL and the MCL. The two wells above the MCL were located in Yolo County (outside of rice-growing areas) and in southern Butte County. The latter well is upgradient of the North Yuba groundwater basin and in an area where higher nitrate concentrations have been repeatedly observed.

The six wells with nitrate concentration between 0.5 MCL and the MCL were located in Glenn County (3 wells), Sutter County (1 well), and Colusa County (2 wells). One well in Glenn County is located in a wide area of non-rice land use and one well in Colusa is at the edge of rice land use. The remaining four wells may capture some rice field discharges to groundwater, but other sources, non-rice agriculture and non-agriculture, are also contributing.

A detailed analysis of the above nitrate results in each of the three USGS well networks is provided in the GAR. In summary, nitrate was not detected in any USGS Rice Well at a level exceeding the applicable drinking water standard (i.e., primary maximum contaminant level (MCL)), and the large majority showed concentrations below the level indicative of anthropogenic impacts. The quality of this shallow groundwater suggests that despite the short distance from the root zone to shallow groundwater observed beneath rice fields, there is no evidence of nitrate contamination degradation to groundwater from rice lands monitored by these wells. This further suggests that rice cultivation is not a source of nitrate contamination throughout areas of rice land use. These results are consistent with geochemical understanding of rice root zone properties and are validated by the other USGS datasets reviewed.

The lines of evidence support the hypothesis that under typical rice growing conditions in the Sacramento Valley, rice operations are not likely to cause or contribute to water quality problems associated with nitrate in groundwater. Low permeability soils combined with saturated conditions contribute to a redox and transport environment that favors the conversion of nitrate to nitrite and volatile gases (denitrification), and that could only very slowly transport nitrogen present in any form to groundwater. As would be expected based on the known behavior of nitrogen in the rice root-zone environment, shallow groundwater in USGS Rice Wells representative of rice land use has low levels of nitrate relative to drinking water quality standards. Further, deep groundwater near rice fields (monitored by USGS GAMA Wells) also contains low nitrate concentrations.

The available evidence indicates that Sacramento Valley groundwater is not vulnerable to nitrate contamination by rice farming. However, data gaps were identified and these general conclusions may be modified for specific areas based on the results of studies or information gathered to fill those data gaps.

E. Groundwater Quality Monitoring and Management Practice Assessment, and Evaluation Requirements

The groundwater quality monitoring, assessment, and evaluation requirements have been developed in consideration of the critical questions developed by the Groundwater Monitoring Advisory Workgroup (listed above). The CRC must collect sufficient data to describe impacts on groundwater quality from rice operations and to determine whether existing or newly implemented management practices comply with the groundwater receiving water limitations of the Order.

As discussed above, the CRC GAR does not indicate that high vulnerability groundwater areas are associated with rice farming operations. The GAR's assessment of typical rice farming conditions indicates that rice farming operations are not expected to cause or contribute to groundwater quality

⁵⁶ The USGS rice wells were included in this study, but the monitoring results have been reported in the USGS shallow rice section.

problems. Since there are no identified high vulnerability areas, the Rice GAR suggests that current management practices associated with rice operations are protective of groundwater quality. The lack of identified high vulnerability areas means the Management Practices Evaluation Program does not need to be initiated with the adoption of the Order. The provisions associated with the Management Practices Evaluation Program (MPEP) will only be triggered if high vulnerability areas associated with rice operations are identified.

The general ILRP strategy for evaluating groundwater quality and protection consists of: 1) a Groundwater Quality Assessment Report (GAR), 2) a Management Practices Evaluation Program, and 3) a Groundwater Quality Trend Monitoring Program.

The purpose of the Groundwater Quality Assessment Report was to analyze existing monitoring data and provide the foundation for designing a Management Practices Evaluation Program, if needed, and the Groundwater Quality Trend Monitoring Program, as well as identifying high vulnerability groundwater areas where a groundwater quality management plan must be developed and implemented.

For the CRC, should a Groundwater Quality Management Plan (GQMP) be required, a Management Practices Evaluation Program Workplan as described in Section IV.D of the MRP would be developed. The MPEP requirements may be addressed through an equivalent evaluation program described in the applicable GQMP.

Should a MPEP be triggered, the purpose of the MPEP is to identify whether existing site-specific and/or rice-specific agricultural management practices are protective of groundwater quality in the high vulnerability areas and to assess the effectiveness of any newly implemented management practices instituted to improve groundwater quality. If the MPEP requirements are triggered, the CRC is required to develop a workplan that describes the tools or methods to be used to associate management practice activities on the land surface with the effect of those activities on underlying groundwater quality. The MPEP would need to be designed to answer GMAW questions 2, 5, 6, and 7. Where applicable, management practices identified as protective of groundwater quality through the MPEP (or equivalent practices) would need to be implemented by Growers, whether the Grower is in a high or low vulnerability area.

The trend monitoring and GAR updates will ensure that the Growers efforts continue to protect water quality. If groundwater quality trends indicate a trend of increasing degradation is occurring in low vulnerability areas, then a Groundwater Quality Management Plan must be developed and implemented.

The MRP requires that a Groundwater Trend Monitoring Workplan be submitted to the Executive Officer for approval by October 2015. As part of the Groundwater Quality Trend Monitoring Workplan, the CRC is required to include a plan to address the Yuba County and fringe areas data gaps and include the proposed elements to resolve the data gaps, as identified in their GAR in Section 7.2.3. The Workplan will provide more details of the wells to be monitored and the schedule for monitoring. The USGS shallow rice wells identified in Table 5 of Attachment B to Order R5-2014-0032 shall be monitored annually, with all wells monitored the first year, then half of the wells monitored the second year and the remaining wells the next. The rotational monitoring of wells in the second and third years will continue unless the CRC requests, and receives an Executive Officer approval, for a modification.

These wells are monitored for general trends in groundwater quality under rice growing lands for the constituents specified in the MRP. Trend monitoring⁵⁷ has been developed to try to answer GMAW questions 1 and 4. Groundwater monitoring to evaluate the effects of rice growing practices on groundwater quality is also required under the MRP when a GQMP is triggered. If the GQMP is triggered, studies and monitoring to evaluate the effect, if any, of rice operations on first encountered groundwater

⁵⁷ Trend monitoring requires yearly monitoring at the same time each year for electrical conductivity, pH, temperature, alkalinity, nitrate + nitrite, as nitrogen, and total Kjeldahl nitrogen. Every five years total dissolved solids, and general minerals (cations and anions).

would answer GMAW questions 2, 5, 6, and 7. Monitoring as outlined in a GQMP will be required in rice areas where water quality problems in the groundwater have been identified with rice operations as a known or possible contributor.

GMAW question 3, which seeks to differentiate sources of existing impact, cannot be easily answered by traditional groundwater monitoring. Trend monitoring will help to answer this question, but other methods such as isotope tracing and groundwater age determination may also be necessary to fully differentiate sources. The MRP does not require these advanced source methods because they are not necessary to determine compliance with the Order.

F. Groundwater Quality Management Plans

Under this Order, groundwater quality management plans (GQMPs) will be required where there are exceedances of water quality objectives, where there is a trend of degradation⁵⁸ that threatens a beneficial use, as well as for high vulnerability groundwater areas if such areas are identified in the future. GQMPs will only be required if rice operations may cause or contribute to the groundwater quality problem. GQMPs are the key mechanism under this Order to help ensure that waste discharges from rice operations are meeting Groundwater Receiving Water Limitation III.B. The limitations apply immediately unless the Grower is implementing the GQMP in accordance with the approved time schedule. The GQMP will include a schedule and milestones for the implementation of management practices (see Appendix MRP-1). The schedule must identify the time needed to identify new management practices necessary to meet the receiving water limitations, as well as a timetable for implementation of identified management practices. The MPEP will be the process used to identify the effectiveness of management practices, where there is uncertainty regarding practice effectiveness under different site conditions. However, the GQMP will also be expected to include a schedule for implementing practices that are known to be effective in partially or fully protecting groundwater quality.

The GQMPs are work plans describing how the CRC will assist their Growers in addressing the identified water quality problem; the types of actions Growers will take to address the identified water quality problem; how the CRC will conduct evaluations of effectiveness of implemented practices; and document consistency with Time Schedule for Compliance (Section XII of the Order). Executive Officer approval indicates concurrence that the GQMP is consistent with the waste discharge requirements and that the proper implementation of the identified practices (or equivalently effective practices) should result in addressing the water quality problem that triggered the preparation of the GQMP. Approval also indicates concurrence that any proposed schedules or interim milestones are consistent with the requirements in section XII of the Order. If the Executive Officer is assured that the growers in the area are taking appropriate action to come into compliance with the receiving water limitations (as described in the GQMP), the growers will be considered in compliance with those limitations. Approval of GQMPs does not establish additional waste discharge requirements or compliance time schedule obligations not already required by these waste discharge requirements. Instead, the Executive Officer is approving a method for determining compliance with the receiving water limitations in the affected area. See *Russian River Watershed Committee v. City of Santa Rosa* (9th Cir. 1998) 142 F.3d 1136; *CASA v. City of Vacaville* (2012) 208 Cal.App.4th 1438.

The main elements of GQMPs are to A) investigate potential rice sources of waste discharge to groundwater, B) review physical setting information for the plan area such as geologic factors and existing water quality data, C) considering elements A and B, develop a strategy with schedule and milestones to implement practices to ensure discharge from rice fields are meeting Groundwater Limitation III.B.1, D) develop a monitoring strategy to provide feedback on GQMP progress, E) develop methods to evaluate data collected under the GQMP, and F) provide reports to the Central Valley Water Board on progress (annual).

⁵⁸ A trend in degradation could be identified through the required trend monitoring or through the periodic updates of the Groundwater Quality Assessment Report.

Elements A – F are necessary to establish a process by which the CRC and Central Valley Water Board are able to investigate waste sources and the important physical factors in the plan area that may impact management decisions (elements A and B), implement a process to ensure effective practices are adopted by Growers (element C), ensure that adequate feedback monitoring is conducted to allow for evaluation of GQMP effectiveness (elements D and E), and facilitate efficient Central Valley Water Board review of data collected on the progress of the GQMP (element F).

Under the Order, the CRC will be required to develop GQMPs that include the above elements. GQMPs will be reviewed and approved by the Executive Officer. Also, because GQMPs may cover broad areas potentially impacting multiple groundwater users in the plan area, these plans will be posted for public review. Prior to plan approval, the Central Valley Water Board Executive Officer will consider public comments on proposed GQMPs.

In accordance with Water Code section 13267, the burden of the GQMP, including costs, is reasonable. The Central Valley Water Board must be informed of the efforts being undertaken by Growers to address identified groundwater quality problems. In addition, a GQMP for multiple or specified areas where rice is grown is a reasonable first step to address identified groundwater quality problems, since the monitoring and planning costs are significantly lower when undertaken collectively by the CRC rather than requiring individual Growers to undertake similar monitoring and planning efforts.

However, if the collective GQMP does not result in the necessary improvements to water quality, the burden, including costs, of requiring individual Growers in the impacted area to conduct monitoring, describe their plans for addressing the identified problems, and evaluate their practices is a reasonable subsequent step. The benefits and necessity of such individual reporting, if collective efforts fail, include, but are not limited to: 1) the need of the board to evaluate the compliance of regulated Growers with applicable orders; 2) the need of the board to understand the effectiveness of practices being implemented by Growers; and 3) the benefits of improved groundwater quality to all users.

VII. Farm Evaluations

The Order requires that all Growers complete a rice-specific farm evaluation describing management practices implemented to protect surface water and groundwater quality. The Grower must use the rice-specific Farm Evaluation template approved by the Executive Officer. The evaluation also includes information such as location of the farm, surface water discharge points, location of in-service wells and abandoned wells, and whether wellhead protection practices have been implemented.

The Order requires all Growers to complete the Farm Evaluation and submit it to the California Rice Commission no later than 1 March 2015. However, the 2014 drought may significantly impact the amount of rice acreage planted and the California Rice Commission's ability to prepare templates for its Growers. Therefore, the Order provides the Executive Officer with the discretion to delay by one year the requirement for Growers to prepare their first Farm Evaluation (to 1 March 2016), if there are fewer than 300,000-350,000 acres of rice planted in 2014.

Growers must update the Farm Evaluation and submit it to the California Rice Commission by 1 March 2016 and annually thereafter, unless a reduced frequency is approved by the Executive Officer after 1 March 2017. If the Executive Officer approves the aforementioned delay in preparation of the Farm Evaluation, the first update of the Farm Evaluation would be due by 1 March 2017 and the Executive Officer would have the discretion to reduce reporting frequency after 1 March 2018.

The farm evaluation is intended to provide the CRC and the Central Valley Water Board with information regarding Grower implementation of the Order's requirements. Without this information, the board would rely solely on representative surface and groundwater monitoring to determine compliance with the Order. Farm evaluations will provide evidence that Growers are implementing management practices to protect groundwater quality while trend data are collected, and to evaluate implementation of any applicable Groundwater Quality Management Plan.

Further, the reporting of practices identified in the farm evaluation will allow the CRC and the Central Valley Water Board to effectively implement an MPEP, should one be triggered. Evaluating management practices at representative sites (in lieu of farm-specific monitoring) only works if the results of the monitored sites can be extrapolated to non-monitored sites. One of the key ways to extrapolate those results will be to have an understanding of which rice farming operations have practices similar to the site that is monitored. The reporting of practices will also allow the board to determine whether the GQMP, if one should be triggered, is being implemented by Growers according to the approved schedule. .

In addition, reporting of practices will allow the CRC and board to evaluate changes in surface water quality relative to changes in practices. The SQMP (should one be triggered) will include a schedule and milestones for the implementation of practices to address identified surface water quality problems. The reporting of practices will allow the board to determine whether the SQMP is being implemented by Growers according to the approved schedule. Absent information on practices being implemented by Growers, the board would not be able to determine whether individual Growers are complying with the Order.

The Executive Officer is given the discretion to reduce the reporting frequency for, if there are minimal year to year changes in the practices reported. This discretion is provided, since the reporting burden would be difficult to justify given the costs if there were minimal year to year changes in the information provided.

VIII. Nitrogen Management Plans

The Order requires Growers to prepare and implement a rice-specific nitrogen management plan no later than 1 March 2016, and update by 1 March annually thereafter. However, the 2014 drought may significantly impact the amount of rice acreage planted and the California Rice Commission's ability to prepare templates for its Growers. Therefore, the Order provides the Executive Officer with the discretion to delay by one year (to 1 March 2017) the requirement for Growers to prepare the first Nitrogen Management Plan, if there are fewer than 300,000-350,000 acres of rice planted in 2014.

The Grower must use the rice-specific Nitrogen Management Plan template approved by the Executive Officer. The Nitrogen Management Plan shall be maintained or be available electronically at the Grower's farming operations headquarters or primary place of business. A copy of the plan must be made available for inspection, upon request, to Central Valley Water Board staff.

The Nitrogen Management Plan requirements are part of the MRP Order for all Growers. Growers in an area where nitrates in groundwater have triggered the need for a GQMP must, as part of GQMP implementation, have their Nitrogen Management Plan certified by a Central Valley Water Board approved third-party and prepare a Nitrogen Management Summary Report that will be submitted to the CRC for reporting.

IX. Spatial Resolution of Farm Evaluation Information

The Order requires reporting to the Central Valley Water Board of management practices identified through the farm evaluation. These data are required to be reported at a township scale (36 square mile area) where the farm is located. The spatial resolution by township provides a common unit that should facilitate analysis of data and comparisons between different areas.

Although the data collected by the CRC from individual Growers will be reported to the board, those data will only be associated with the township where the enrolled parcel is located and will not be associated with the Grower or their enrolled parcel. For example, the CRC may have information submitted for 180 different parcels in a given township. The board would receive 180 individual data records for that township, but the individual data records would not be associated with a specific parcel or Grower

In order to determine whether Growers in a given township are implementing practices necessary to meet the Order's requirements, the CRC will need to assess the data collected from Farm Evaluations

and evaluate trends. The CRC's assessment and evaluation will be provided in the CRC's annual monitoring report.. By receiving the individual data records, identified to at least the township level, the board will be able to determine whether individual Growers are in compliance and the board will be able to identify specific data records for additional follow-up. The board will be able to independently verify the assessments and evaluations conducted by the third-party. The board, as well as other stakeholders, can also conduct its own analysis and interpretation of the data, which may not be possible if only summary information for implemented management practices were provided. If the data suggest that growers are not improving their practices, the Executive Officer can require the CRC to submit the management practice information.

X. Special study reports

Additional technical reports may include field specific special or source identification studies at the direction of the Executive Officer, or as requested by the CRC and approved by the Executive Officer. The Executive Officer may require special studies where regional monitoring is ineffective in determining potential sources of water quality problems, to identify whether management practices are effective, or to determine whether individual Grower parcels are causing exceedances of water quality objectives. Special studies help ensure that the potential information gaps described above under the Order's regional monitoring may be filled through targeted technical reports, instead of more costly individual monitoring programs.

XI. Technical Reports

The surface water and trend groundwater quality monitoring under the Order is representative in nature instead of individual field discharge monitoring. The monitoring sites are established to be representative of the effect of discharges from rice lands on water quality. Areas that are represented by the monitoring site have the same or similar characteristics to the area discharging to the monitored site. The land use immediately upstream of the monitored sites is rice operations which is the same land use in unmonitored areas. Therefore, it is reasonable to use the results from the monitored sites to draw conclusions regarding water quality impacts in areas that are not being monitored.

The benefits of representative monitoring include the ability to determine whether receiving waters accepting discharges from rice lands are meeting water quality objectives. Representative monitoring also allows the Central Valley Water Board to determine whether practices are protective of water quality.

Therefore, if Surface Water Quality Management Plans and Groundwater Quality Management Plans are triggered, such plans must evaluate the effectiveness of management practices in protecting water quality. In addition, Growers must report the practices they are implementing to protect water quality. Through the evaluations and studies conducted by the CRC, the reporting of practices by the Growers on the Farm Evaluations, and the board's compliance and enforcement activities, the board will be able to determine whether a Grower is complying with the Order.

An effective method of determining compliance with water quality objectives is water quality monitoring at the individual level. Individual monitoring may also be used to help determine sources of water quality problems. Individual monitoring of waste discharges is required under many other Water Board programs. Examples of such programs include regulation of wastewater treatment plants and the Central Valley Water Board's Dairy Program.⁵⁹ The costs of individual monitoring would be much higher than representative surface and groundwater quality monitoring required under the Order. Representative monitoring site selection may be based on a group or category of represented waste discharges that will provide information required to assess compliance for represented Growers, reducing the number of samples needed to evaluate compliance with the requirements of this Order. The CRC is tasked with

⁵⁹ The dairy program requires individual monitoring of surface water discharges and allows for a "representative" groundwater monitoring in lieu of individual groundwater monitoring.

ensuring that selected monitoring sites are representative of waste discharges from all rice operations within the Order's boundaries.

This Order requires the CRC to provide technical reports. These reports may include special studies at the direction of the Executive Officer, or as requested by the CRC and approved by the Executive Officer. The Executive Officer may require special studies where representative monitoring is ineffective in determining potential sources of water quality problems or to identify whether management practices are effective. Special studies help ensure that the potential information gaps described above under the Order's representative monitoring requirements may be filled through targeted technical reports, instead of more costly individual monitoring programs.

The Board recognizes that representative monitoring data in and of itself will not allow the Board to determine the specific source or sources of water quality problems; however, subsequent actions, assessments and reporting required of the third party will result in the identification of the source(s) and causes of the water quality problem, the identification of actions implemented by Members to ensure water quality is protected, and the reporting of water quality data to demonstrate the water quality problem has been resolved. Therefore, representative monitoring in conjunction with other requirements in this Order and the board's compliance and enforcement activities will also allow the board to determine whether Members are complying with this Order.

XII. Reports and Plans

This Order is structured such that the Executive Officer is to make determinations regarding the adequacy of reports and information provided by the CRC or Growers and allows the Executive Officer to approve such reports. All plans and reports that require approval by the Executive Officer will be posted on the board's website upon approval. In addition, this Order identifies specific reports and Executive Officer's decisions that must be posted for public comment and review. It is the right of any interested person to request the Central Valley Water Board to review any of the aforementioned Executive Officer decisions.

XIII. Approach to Implementation and Compliance and Enforcement

The board has been implementing the Irrigated Lands Regulatory Program since 2003. The implementation of the program has included compliance and enforcement activities to ensure growers have the proper regulatory coverage and are in compliance with the applicable board orders. The following section describes the state-wide policy followed by the board, as well as how the board intends to implement and enforce the Order.

The State Water Board's Water Quality Enforcement Policy (Enforcement Policy) defines an enforcement process that addresses water quality in an efficient, effective, and consistent manner⁶⁰. A variety of enforcement tools are available in response to noncompliance. The Enforcement Policy endorses the progressive enforcement approach which includes an escalating series of actions from informal to formal enforcement. Informal enforcement actions are any enforcement taken by staff that is not defined in statute or regulation, such as oral, written, or electronic communication concerning violations. The purpose of informal enforcement is to quickly bring an actual, threatened, or potential violation to the discharger's attention and to give the discharger an opportunity to return to compliance as soon as possible. Formal enforcement includes statutorily based actions that may be taken in place of, or in addition to, informal enforcement. Formal enforcement is recommended as a first response to more significant violations, such as the highest priority violations, chronic violations, and/or threatened violations. There are multiple options for formal enforcement, including Administrative Civil Liabilities (ACLs) imposed by a Regional Water Board or the State Water Board. A 30-day public comment period

⁶⁰ State Water Resources Control Board. 2010. Water Quality Enforcement Policy.
<http://www.swrcb.ca.gov/water_issues/programs/enforcement/docs/enf_policy_final111709.pdf>

is required prior to the settlement or imposition of any ACL and prior to settlement of any judicial civil liabilities.

A. Compliance/Enforcement Related to Water Quality Violations

The board intends to respond promptly to complaints and conduct field inspections on a routine basis to identify potential water quality violations. Complaints will generally result from local residents contacting the board based on their observations of sediment plumes, fish kills, or odor problems. The board will generally contact and coordinate with the third-party, the California Department of Fish and Wildlife, and the local county agricultural commissioner depending on the nature of the problem.

In addition, the board staff will conduct field inspections of individual grower's operations to determine whether practices protective of groundwater are in place. Such practices include backflow prevention devices; well head protection; and those practices found protective through the Management Practices Evaluation Program. The field inspections will also include a review of whether implemented practices are protective of surface water, and may include sampling of runoff. The informal and formal enforcement process described above will be used should any violations of the Order be identified through field inspections.

B. Compliance/Enforcement Related to Information Collected

As a part of field inspections, and with the consent of the Growers, owner or authorized representative as required by applicable laws, staff may also review information and farm plans prepared by Growers. The Executive Officer will request information, as necessary, from Growers and the CRC to audit the quality and accuracy of information being submitted. The Executive Officer will regularly report to the board on the results of any audits of the information reported by the third-party, the outcome of any field verification inspections of information submitted by the Growers, and make recommendations regarding changes to the reporting requirements and the information submittal process, if needed.

The findings of this Order provide a further description of the enforcement priorities and process for addressing violations.

XIV. Water Quality Objectives

Surface water and groundwater limitations in section III of the Order specify that waste discharged from rice lands shall not cause or contribute to an exceedance of water quality objectives in surface water or underlying groundwater, or a trend that may threaten applicable Basin Plan beneficial uses, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

Water quality objectives that apply to surface water are described in the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan). Applicable water quality objectives include, but are not limited to, (1) the numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Title 22 California Code of Regulations (CCR) Division 4, Chapter 15 sections 64431, 64444 and 64449 that are applicable through the Basin Plan to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, and the turbidity objectives, and (2) the narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, the taste and odor objective, the pesticides objective, the sediment objective, and the toxicity objective. The Basin Plan also contains numeric water quality objectives that apply to specifically identified water bodies, such as specific temperature and salinity objectives. Federal water quality criteria that apply to surface water are contained in federal regulations referred to as the California Toxics Rule and the National Toxics Rule. CFR, sections 131.36 and 131.38.

Water quality objectives that apply to groundwater include, but are not limited to, (1) numeric objectives, including the bacteria objective and the chemical constituents objective (includes state MCLs promulgated in Title 22 CCR Division 4, Chapter 15, sections 64431, and 64444, and 64449, and are

applicable through the Basin Plan to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives.

The requirements that waste discharge not unreasonably affect beneficial uses or cause a condition of pollution or nuisance are prescribed pursuant to sections 13263 and 13241 of the California Water Code. Section 13263 of the California Water Code requires Regional Water Boards, when establishing waste discharge requirements, to consider the need to prevent nuisance and the provisions in section 13241 of the California Water Code. Section 13241 requires Regional Water Boards to consider several factors when establishing water quality objectives including prevention of nuisance and reasonable protection of beneficial uses.

Implementation of Water Quality Objectives

The Basin Plan includes numeric and narrative water quality objectives. The narrative toxicity objective states: *“All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.”* The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituent objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, *“...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)”* in Title 22 of the California Code of Regulation (CCR) The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: *“Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.”*

The Sacramento-San Joaquin Basin Plan, starting at page IV-16.00, contains an implementation policy, “Policy for Application of Water Quality Objectives”, that includes a description of how the Central Valley Water Board will evaluate compliance with the narrative water quality objectives. The Policy states, in part, “To evaluate compliance with the narrative water quality objectives, the Regional Water Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations...” For purposes of this Order, these and other applicable Basin Plan provisions will be used as part of the process described below.

Implementation of numeric and narrative water quality objectives under the Order involves an iterative process. The Order’s MRP establishes management plan trigger limits that are equivalent to the applicable Basin Plan numeric water quality objectives. For constituents that are not assigned Basin Plan numeric water quality objectives, Central Valley Water Board staff will develop trigger limits in consultation with the Department of Pesticide Regulation (for pesticides), and other agencies as appropriate. Central Valley Water Board staff will provide interested parties, including the CRC, with an opportunity to review and comment on the trigger limits. The Executive Officer will then provide the trigger limits to the CRC. Those trigger limits will be considered the numeric interpretation of the applicable narrative objectives. In locations where trigger limits are exceeded, water quality management plans must be developed that will form the basis for reporting which steps have been taken by Growers to achieve compliance with numeric and narrative water quality objectives.

XV. Nonpoint Source Program (NPS)

The Order regulates waste discharges from rice lands to state waters as an NPS program. Accordingly, these waste discharge requirements must implement the provisions of the State Water Board’s *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy). Under the NPS Policy, the Regional Water Board must find that the program will promote attainment of water

quality objectives. The nonpoint-source program also must meet the requirements of five key structural elements. These elements include (1) the purpose of the program must be stated and the program must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements; (2) describe the practices to be implemented and processes to be used to select and verify proper implementation of practices; (3) where it is necessary to allow time to achieve water quality requirements, include a specific time schedule, and corresponding quantifiable milestones designed to measure progress toward reaching specified requirements; (4) feedback mechanisms to determine whether the program is achieving its purpose; and (5) the consequences of failure to achieve the stated purpose.

The Order addresses each of the five key elements, as described below.

- (1) The purpose of the long-term irrigated lands regulatory program, of which the Order is an implementing mechanism for rice lands in the Sacramento Valley, is stated above under the section titled "Goals and Objectives of the Irrigated Lands Regulatory Program."⁶¹ The program goals and objectives include meeting water quality objectives. The requirements of this Order include requirements to meet applicable water quality objectives and requirements of State Water Board Resolution 68-16 (antidegradation requirements). Further discussion of this Order's implementation of the antidegradation policy is given below under the section titled "State Water Board Resolution 68-16."
- (2) The board is prevented by Water Code section 13360 from prescribing specific management practices to be implemented. However, it may set forth performance standards and require dischargers to report on what practices they have or will implement to meet those standards. Examples of the types of practices that irrigated agricultural operations may implement to meet program goals and objectives have been described in the Economics Report⁶² and evaluated in the *Program Environmental Impact Report* (PEIR)⁶³ for the long-term ILRP. This Order requires each individual rice operation to develop a farm evaluation that will describe their management practices in place to protect surface water and groundwater quality. This Order also requires the development of surface/groundwater quality management plans (SQMPs/GQMPs) in areas where there are exceedances of water quality objectives. The requirements for SQMPs and GQMPs include that the CRC identify management practices and develop a process for evaluating the effectiveness of such practices. The requirements of the Order are consistent with Key Element 2.
- (3) This Order requires the development of SQMPs/GQMPs in areas where water quality objectives are not met. SQMPs/GQMPs must include time schedules for implementing the plans and meeting the surface and groundwater receiving water limitations (section III of the Order) as soon as practicable, but within a maximum of 10 years for surface and groundwater. The time schedules must be consistent with the requirements for time schedules set forth in this Order. The time schedules must include quantifiable milestones that will be reviewed by the Executive Officer and the public prior to approval. The time schedule requirements in the Order are consistent with Key Element 3.

⁶¹ The goals and objectives were developed as part of the ILRP Program Environmental Impact Report, ICF International. 2011. *Irrigated Lands Regulatory Program - Program Environmental Impact Report*. Final and Draft. March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA. .

⁶² ICF International. 2010. *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program*. July. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA.

⁶³ ICF International. 2011. *Irrigated Lands Regulatory Program - Program Environmental Impact Report*. Final and Draft. March. (ICF 05508.05.) Sacramento, CA. Prepared for Central Valley Regional Water Quality Control Board, Sacramento, CA.

- (4) To provide feedback on whether program goals are being achieved, this Order requires surface and groundwater quality monitoring, tracking of management practices, and evaluation of effectiveness of implemented practices. The feedback will allow iterative implementation of practices to ensure that program goals are achieved. The feedback mechanisms required by the Order are consistent with Key Element 4.
- (5) This Order establishes the following consequences where requirements are not met:
 - (a) The CRC or Growers will be required, in an iterative process, to conduct additional monitoring and/or implement management practices where water quality objectives are not being met;
 - (b) Appropriate Central Valley Water Board enforcement action where the iterative management practices process is unsuccessful, program requirements are not met, or time schedules are not met;
 - (c) Require noncompliant Growers of all rice lands where the CRC fails to meet the requirements of this Order, to submit of a report of waste discharge to obtain individual waste discharge requirements from the Central Valley Water Board (i.e., revoke coverage under this Order).

The Order describes consequences for failure to meet requirements and is consistent with Key Element 5.

XVI. California Environmental Quality Act (CEQA)

For the purposes of adoption of the Order, the Central Valley Water Board is the lead agency pursuant to CEQA (Public Resources Code sections 21100 et seq.). The Central Valley Water Board has prepared a *Final Program Environmental Impact Report (PEIR)*⁶⁴ that analyzes the potential environmental impacts of six alternatives for a long term ILRP. As described more fully in Attachment D, this Order relies upon the PEIR for CEQA compliance. The requirements of the Order include regulatory elements that are also contained in the six alternatives analyzed in the PEIR. Therefore, the actions by Growers to protect water quality in response to the requirements of this Order are expected to be similar to those described for Alternatives 2-6 of the PEIR (Alternative 1 does not include groundwater protection).

The PEIR describes that potential environmental impacts of all six alternatives are associated with implementation of water quality management practices, construction of monitoring wells, and impacts to agriculture resources (e.g., loss of production of prime farmland) due to increased regulatory costs. Under the Order, Growers will be required to implement water quality management practices to address water quality concerns. The PEIR describes and evaluates potential impacts of practices likely to be implemented to meet water quality and other management goals on irrigated lands. These water quality management practices include:

- Nutrient management
- Improved water management
- Tailwater recovery system
- Pressurized irrigation
- Sediment trap, hedgerow, or buffer,
- Cover cropping or conservation tillage
- Wellhead protection

These practices are examples of the types of practices that would be broadly applied by irrigated agricultural operations throughout the Central Valley and are considered representative of the types of practices that would have potential environmental impacts. It is important to note that the evaluated practices are not required; operators will have the flexibility to select practices to meet water quality

⁶⁴ ICF International. 2011. *Irrigated Lands Regulatory Program Final Program Environmental Impact Report*. Final. March. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA

goals. The Order represents one order in a series of orders that will be developed, based on the alternatives evaluated in the PEIR for all irrigated agriculture within the Central Valley.

Because Sacramento Valley rice lands represent a single commodity, instead of all commodities within the Central Valley, it is possible to further narrow the types of practices that may be implemented in response to the requirements in the order. Of the types of management practices evaluated in the PEIR, only the following may be implemented by Growers:

- Nutrient management
- Wellhead protection

Pressurized irrigation systems are not used on Sacramento Valley rice fields since most fields are leveled to control surface irrigation flow, so that they can be efficiently flooded for extended periods of time. For this same reason, cover crops are seldom planted by Growers. The flooded fields essentially function as sediment basins and tailwater return systems. This is reflected in the economic evaluation⁶⁵ for the long-term program (hereafter referred to as the Economics Report), indicating that 100 percent of rice operations have capabilities equivalent to a tailwater recovery system, i.e., the infrastructure is in place to hold water in a field without additional construction practices. The Economics Report also describes that 100 percent of rice operations already have irrigation water management practices in place that can regulate the flow on and off the rice field.⁶⁶ Therefore, these practices are already implemented on all rice fields and would not be implemented as a result of the Order. Consequently, many of the significant effects identified in the PEIR do not apply when considering implementation of the Order.

The requirements of the Order would lead to implementation of the above, rice-specific practices to a similar degree as is described for Alternatives 2-6 analyzed in the PEIR. Also, the Order may require installation of monitoring wells (depending on the adequacy of existing wells for water quality monitoring).

Because the basis for evaluation of the Order's potential impacts is the PEIR, which applies to all irrigated agricultural operations within the Central Valley, Attachment D, Findings of Fact and Statement of Overriding Considerations, of this Order provides impact findings described in the PEIR that are applicable to the Order Mitigation Measures.

The impacts described above, except for cumulative climate change can be reduced to a less than significant level through the employment of alternate practices or by choosing a location that avoids sensitive areas (e.g., installing a monitoring well in a developed area rather than in an area that provides riparian habitat). Where no alternate practice or less sensitive location for a practice exists, this Order requires the CRC and Growers choosing to employ these practices to avoid impacts to sensitive resources by implementing the mitigation measures described in Attachment C. A CEQA Mitigation Monitoring and Reporting Program is included in Attachment B of this Order, Monitoring and Reporting Program R5-2014-0032.

XVII. Statement of Policy With Respect to Maintaining High Quality Waters in California (State Water Board Resolution 68-16)

This section of the Information Sheet first provides background on State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16). Following the background discussion, the Information Sheet describes how the various provisions in the

⁶⁵ ICF International. 2010. *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program*. July. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA.

⁶⁶ Irrigation water management practices are designed to optimize the use of irrigation water for crop production by matching the timing and uniformity of irrigation to the soil water depletion. Examples include proper timing of irrigation to reduce crop stress and susceptibility to disease and pest infestation; reduction of runoff due to overwatering and thus the likelihood that nutrients or pesticides will be transported off site.

WDR and MRP collectively implement Resolution 68-16. In summary, the requirements of Resolution 68-16 are met through a combination of upfront planning and implementation at the farm level; representative monitoring and assessments to determine whether trends in degradation are occurring; and regional planning and on-farm implementation when degradation trends are identified.

Initially, all Growers will need to conduct an on-farm evaluation to determine whether their practices are protective of water quality and whether they are meeting the established farm management performance standards. Through the process of becoming aware of effective management practices; evaluating their practices; and implementing improved practices; Growers are expected to meet the farm management performance standards and, thereby, achieve best practicable treatment or control (BPTC), where applicable. All Growers must prepare and implement a farm-specific nitrogen management plan. Implementation of the nitrogen management plan should result in achieving BPTC for nitrates discharged to groundwater.

Representative monitoring of surface water and groundwater together with periodic assessments of available surface water and groundwater information is required to determine compliance with water quality objectives and determine whether any trends in water quality (improvement or degradation) are occurring. If trends in such degradation are identified that could result in impacts to beneficial uses, a surface water (or groundwater) quality management plan must be prepared by CRC. The plan must include the identification of practices that will be implemented to address the trend in degradation and an evaluation of the effectiveness of those practices in addressing the degradation. The CRC must report on the implementation of practices by its Growers. Failure of Growers to implement practices to meet farm management performance standards or address identified water quality problems will result in further direct regulation by the board, including, but not limited to, requiring individual farm water quality management plans; regulating the individual grower directly through WDRs for individual farmers; or taking other enforcement action.

As discussed further below, the combination of these requirements fulfills the requirements of Resolution 68-16 for any degradation of high quality waters authorized by this Order.

A. Background

Basin Plan water quality objectives are developed to ensure that ground and surface water beneficial uses are protected. The quality of some state ground and surface waters is higher than established Basin Plan water quality objectives. For example, nutrient levels in good, or “high quality” waters may be very low, or not detectable, while existing water quality standards for nutrients may be much higher. In such waters, some degradation of water quality may occur without compromising protection of beneficial uses. State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16) was adopted in October of 1968 to address high quality waters in the state. Title 40 of the Code of Federal Regulations, Section 131.12—Antidegradation Policy (40 CFR 131.12) was developed in 1975 to ensure water quality necessary to protect existing uses in waters of the United States. Resolution 68-16 applies to discharges to all high quality waters of the state, including groundwater and surface water (Water Code section 13050[e]); 40 CFR 131.12 applies only to surface waters.

The requirement to implement the Antidegradation Policy is contained in Resolution 68-16 (provision 2 presented below) and in the Basin Plan. The Basin Plan states that the Central Valley Water Board actions must conform with State Water Board plans and policies and among these policies is Resolution 68-16, which requires that:

1. *“Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.”*

2. *“Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”*

For discharges to surface waters only, the Federal Antidegradation Policy (Section 131.12, Title 40, CFR) requires:

1. *“Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.*
2. *Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State’s continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.*
3. *When high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.*
4. *In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.”*

The State Water Board has interpreted Resolution 68-16 to incorporate the Federal Antidegradation Policy in situations where the policy is applicable. (SWRCB Order WQ 86-17.) The application of the Federal Antidegradation Policy to nonpoint source discharges (including discharges from irrigated agriculture) is limited.⁶⁷

Administrative Procedures Update (APU) 90-004, Antidegradation Policy Implementation for NPDES Permitting, provides guidance for the Regional Water Boards in implementing Resolution 68-16 and 40 CFR 131.12, as these provisions apply to NPDES permitting. APU 90-004 is not applicable in the context of this Order because nonpoint discharges from agriculture are exempt from NPDES permitting.

A number of key terms are relevant to application of Resolution 68-16 and 40 CFR 131.12 to this Order. These terms are described below.

⁶⁷ 40 CFR 131.12(a)(2) requires that the “State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and *all cost-effective and reasonable best management practices for nonpoint source control.*” The EPA Handbook, Chapter 4, clarifies this as follows: “Section 131.12(a)(2) does not mandate that States establish controls on nonpoint sources. The Act leaves it to the States to determine what, if any, controls on nonpoint sources are needed to provide attainment of State water quality standards (See CWA Section 319). States may adopt enforceable requirements, or voluntary programs to address nonpoint source pollution. Section 40 CFR 131.12(a)(2) does not require that States adopt or implement best management practices for nonpoint sources prior to allowing point source degradation of a high quality water. However, States that have adopted nonpoint source controls must assure that such controls are properly implemented before authorization is granted to allow point source degradation of water quality.” Accordingly, in the context of nonpoint discharges, the BPTC standard established by state law controls

High Quality Waters: Resolution 68-16 applies whenever “existing quality of water is better than quality established in policies as of the date such policies become effective,”⁶⁸ and 40 CFR 131.12 refers to “quality of waters [that] exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation.” Such waters are “high quality waters” under the state and federal antidegradation policies. In other words, high quality waters are waters with a background quality of better quality than that necessary to protect beneficial uses.⁶⁹ The Water Code directs the State Water Board and the Regional Water Boards to establish water quality objectives for the reasonable protection of beneficial uses. Therefore, where water bodies contain levels of water quality constituents or characteristics that are better than the established water quality objectives, such waters are considered high quality waters.

Both state and federal guidance indicate that the definition of high quality waters is established by constituent or parameter [State Water Board Order WQ 91-10; USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) (“EPA Handbook”)]. Waters can be of high quality for some constituents or beneficial uses but not for others. With respect to degraded groundwater, a portion of the aquifer may be degraded with waste while another portion of the same aquifer may not be degraded with waste. The portion not degraded is high quality water within the meaning of Resolution 68-16 (see State Water Board Order WQ 91-10).

In order to determine whether a water body is a high quality water with regard to a given constituent, the background quality of the water body unaffected by the discharge must be compared to the water quality objectives. If the quality of a water body has declined since the adoption of the relevant policies and that subsequent lowering was not a result of regulatory action consistent with the state antidegradation policy, a baseline representing the historically higher water quality may be an appropriate representation of background.⁷⁰ However, if the decline in water quality was permitted consistent with state and federal antidegradation policies, the most recent water quality resulting from permitted action constitutes the relevant baseline for determination of whether the water body is high quality (see, e.g., SWRCB Order WQ 2009-0007, page 12). Additionally, if water quality conditions have improved historically, the current higher water quality would again be the point of comparison for determining the status of the water body as a high quality water.

Best Practicable Treatment or Control: Resolution 68-16 requires that, where degradation of high quality waters is permitted, best practicable treatment or control (BPTC) limits the amount of degradation that may occur. Neither the Water Code nor Resolution 68-16 defines the term “best practicable treatment or control.”

Despite the lack of a BPTC definition, certain State Water Board water quality orders and other documents provide direction on the interpretation of BPTC. The State Water Board has stated: “one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality” (see Order WQ 2000-07, pages 10-11). In a “Questions and Answers” document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to additionally include a comparison of the proposed method to existing proven technology, evaluation of performance data (through treatability studies), comparison of alternative methods of treatment or control, and consideration of methods currently

⁶⁸ Such policies would include policies such as State Water Board Resolution 88-63, Sources of Drinking Water Policy, establishing beneficial uses, and water quality control plans.

⁶⁹ USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) , defines “high quality waters” as “those whose quality exceeds that necessary to protect the section 101(a)(2) goals of the Act [Clean Water Act], regardless of use designation.”

⁷⁰ The state antidegradation policy was adopted in 1968, therefore water quality as far back as 1968 may be relevant to an antidegradation analysis but it will vary depending on the effective date of the policy (e.g., water quality objective). For purposes of application of the federal antidegradation policy only, the relevant year would be 1975.

used by the discharger or similarly situated dischargers.⁷¹ The costs of the treatment or control should also be considered. Many of the above considerations are made under the “best efforts” approach described later in this section. In fact, the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through “best efforts.”

The Regional Water Board may not “specify the design, location, type of construction, or particular manner in which compliance may be had with [a] requirement, order, or decree” (Water Code 13360). However, the Regional Water Board still must require the discharger to demonstrate that the proposed manner of compliance constitutes BPTC (SWRCB Order WQ 2000-7). The requirement of BPTC is discussed in greater detail below.

Maximum Benefit to People of the State: Resolution 68-16 requires that where degradation of water quality is permitted, such degradation must be consistent with the “maximum benefit to people of the state.” Only after “intergovernmental coordination and public participation” and a determination that “allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located” does 40 CFR 131.12 allow for degradation.

As described in the Question and Answers Document, factors considered in determining whether degradation of water quality is consistent with maximum benefit to people of the State include economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. With reference to economic costs, both costs to the dischargers and the affected public are considered. Closely related to the BPTC requirement, consideration must be given to alternative treatment and control methods and whether lower water quality can be abated or avoided through reasonable means, and the implementation of feasible alternative treatment or control methods should be considered.

USEPA guidance clarifies that the federal antidegradation provision “is not a ‘no growth’ rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in “high quality waters” is necessary to accommodate important economic or social development” (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4). Similarly, under Resolution 68-16, degradation is permitted where maximum benefit to the people of the state is demonstrated.

Water Quality Objectives and Beneficial Uses: As described above, Resolution 68-16 and Section 40 CFR 131.12 are both site-specific evaluations that are not easily employed to address large areas or broad implementation for classes of discharges. However, as a floor, any degradation permitted under the antidegradation policies must not cause an exceedance of water quality objectives or a pollution or nuisance. Furthermore, the NPS Policy establishes a floor for all water bodies in that implementation programs must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses.

Waters that are Not High Quality: The “Best Efforts” Approach:

Where a water body is not high quality and the antidegradation policies are accordingly not triggered, the Central Valley Water Board should, under State Water Board precedent, set limitations more stringent than the objectives set forth in the Basin Plan. The State Water Board has directed that, “where the constituent in a groundwater basin is already at or exceeding the water quality objective... the Regional Water Board should set limitations more stringent than the Basin Plan objectives if it can be shown that those limitations can be met using ‘best efforts.’” SWRCB Order WQ 81-5; see

⁷¹ See Questions and Answers, State Water Resources Control Board, Resolution 68-16 (February 16, 1995).
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also SWRCB Orders Nos. WQ 79-14, WQ 82-5, WQ 2000-07. Finally, the NPS Policy establishes standards for management practices.

The “best efforts” approach involves the Regional Water Board establishing limitations expected to be achieved using reasonable control measures. Factors which should be analyzed under the “best efforts” approach include the effluent quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance (SWRCB Order WQ 81-5, page 7). The State Water Board has applied the “best efforts” factors in interpreting BPTC (see SWRCB Order Nos. WQ 79-14, and WQ 2000-07).

In summary, the board may set discharge limitations more stringent than water quality objectives even outside the context of the antidegradation policies. The “best efforts” approach must be taken where a water body is not “high quality” and the antidegradation policies are accordingly not triggered.

B. Application of Resolution 68-16 Requirements to this Order

The determination of high quality water within the meaning of the antidegradation policies is water body and constituent-specific. Very little guidance has been provided in state or federal law with respect to applying the antidegradation policy to a program or general permit where multiple water bodies are affected by various discharges, some of which may be high quality waters and some of which may, by contrast, have constituents at levels that already exceed water quality objectives. Given these limitations, the board has used readily available information regarding the water quality status of surface water and groundwater in the Sacramento Valley to construct provisions in this Order to meet the substantive requirements of Resolution 68-16.

This Order regulates discharges from thousands of individual fields to a very large number of water bodies within the Sacramento Valley. There is no comprehensive, waste constituent-specific information available for all surface waters and groundwater aquifers accepting wastes discharged from rice lands that allow site-specific assessment of current conditions. Likewise, there are no comprehensive historic data. However, available information and analysis that should be representative of discharges from rice operations do not indicate that such discharges are causing or contributing to exceedances of water quality objectives or increasing trends of degradation.

Given the significant variation in conditions over the broad areas covered by this Order, any application of the antidegradation requirements must account for the fact that at least some of the waters into which agricultural discharges will occur are high quality waters (for some constituents). Further, the Order provisions should also account for the fact that even where a water body is not high quality (such that discharge into that water body is not subject to the antidegradation policy), the board should, under State Water Board precedent, impose limitations more stringent than the objectives set forth in the Basin Plan, if those limits can be met by “best efforts.”

C. Consistency with BPTC and the “Best Efforts” Approach

Rice, as a single commodity grown with similar management practices in similar soils, is unique in that BPTC or “best efforts” can be identified and implemented for the majority of Growers. For example, the effectiveness of the Rice Pesticides Program (RPP) in using management practices to achieve water quality performance goals is consistent with the “best efforts” approach. The uniformity of management practices for Growers and the use of the conceptual site model allows for the use of available data to determine the general effect of rice operations on surface water and groundwater.

Growers need the flexibility to choose management practices that best achieve a management measure’s performance expectations given their own unique circumstances. Management practices developed for agriculture are to be used as an overall system of measures to address nonpoint-source pollution sources on any given site. In most cases, not all of the practices will be needed to address the nonpoint sources at a specific site. Operations may have more than one constituent of concern to address and may need to employ two or more of the practices to address the multiple sources. Where

more than one source exists, the application of the practices should be coordinated to produce an overall system that adequately addresses all sources for the site in a cost-effective manner.

There is no specific set of technologies, practices, or treatment devices that can be said to achieve BPTC/best efforts universally in the watershed. This Order, therefore, establishes a set of performance standards that must be achieved and an iterative planning approach that will lead to implementation of BPTC/best efforts. The iterative planning approach will be implemented as two distinct processes, 1) establishment of a baseline set of universal farm water quality management performance standards combined with upfront evaluation, planning and implementation of management practices to attain those goals, and 2) additional planning and implementation measures where degradation trends are observed that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met). Taken together, these processes are considered BPTC/best efforts. The planning and implementation processes that growers must follow on their farms should lead to the on-the-ground implementation of the optimal practices and control measures to address waste discharge from irrigated agriculture.

1. Farm Management Performance Standards

This Order establishes on farm standards for implementation of management practices that all Growers must achieve. The selection of appropriate management practices must include analysis of site-specific conditions, waste types, discharge mechanisms, and crop types. Considering this, as well as the Water Code 13360 mandate that the Regional Water Board not specify the manner of compliance with its requirements, selection must be done at the farm level. Following are the performance standards that all Growers must achieve:

- a. minimize waste discharge offsite in surface water,
- b. minimize or eliminate the discharge of sediment above background levels,
- c. minimize percolation of waste to groundwater,
- d. minimize excess nutrient application relative to crop consumption,
- e. prevent pollution and nuisance,
- f. achieve and maintain water quality objectives and beneficial uses,
- g. protect wellheads from surface water intrusion.

BPTC is not defined in Resolution 68-16. However, the State Water Board describes in its 1995 Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g., through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers." Available state and federal guidance on management practices may serve as a measure of the types of water quality management goals for irrigated agriculture recommended throughout the state and country (e.g., water quality management goals for similarly situated dischargers). This will provide a measure of whether implementation of the above performance standards will lead to implementation of BPTC/best efforts.

- As part of California's Nonpoint Source Pollution Control Program, the State Water Board, California Coastal Commission, and other state agencies have identified seven management measures to address agricultural nonpoint sources of pollution that affect state waters (*California's Management Measures for Polluted Runoff*, referred to below as "Agriculture Management Measures").⁷² The agricultural management measures include practices and plans installed under various NPS programs in California, including systems of practices commonly used and recommended by the USDA as components of resource management systems, water quality management plans, and agricultural waste management systems.

⁷² *California's Management Measures for Polluted Runoff*
(http://www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf)

- USEPA's National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003);⁷³ *"is a technical guidance and reference document for use by State, local, and tribal managers in the implementation of nonpoint source pollution management programs. It contains information on the best available, economically achievable means of reducing pollution of surface and ground water from agriculture."*

Both of the above guidance documents describe a series of management measures, similar to the farm management performance standards and related requirements of the Order. The agricultural management measures described in the state and USEPA reference documents generally include: 1) erosion and sediment control, 2) facility wastewater and runoff from confined animal facilities, 3) nutrient management, 4) pesticide management, 5) grazing management, 6) irrigation water management, and 7) education and outreach. A comparison of the recommendations with the Order's requirements is provided below.

Management measure 1 is not applicable, as discharges from rice fields are controlled releases and are not expected to cause erosion or excess sediments from the fields.

Management measure 2 is not applicable, as this Order does not address waste discharges from confined animal facilities.

Management measure 3, nutrient management. As described in the State's Agricultural Management Measures document, *"this measure addresses the development and implementation of comprehensive nutrient management plans for areas where nutrient runoff is a problem affecting coastal waters and/or water bodies listed as impaired by nutrients."* Nutrient management practices implemented to meet performance standards are consistent with this measure. The Order also requires nitrogen management plans to be developed by Growers. Nitrogen management plans require Growers to document how their fertilizer use management practices meet performance standard d. Finally, where nutrients are causing exceedances of water quality objectives in surface waters, this Order would require development of a detailed SQMP which would address sources of nutrients and require implementation of practices to manage nutrients. Collectively, these requirements work together in a manner consistent with management measure 3.

Management measure 4, pesticide management. As described in the State's Agricultural Management Measures document, this measure *"is intended to reduce contamination of surface water and groundwater from pesticides."* Performance standards a, c, e, f, and g are consistent with this management measure, requiring Growers to implement practices that minimize waste discharge to surface and groundwater (such as pesticides), prevent pollution and nuisance, achieve and maintain water quality objectives, and implement wellhead protection measures.

Management measure 5 is not applicable, as this Order only applies to rice fields in the Sacramento Valley.

Management measure 6, irrigation water management. As described in the state Agricultural Management Measures document, this measure *"promotes effective irrigation while reducing pollutant delivery to surface and ground waters."* Performance standards a and c, requiring Growers to minimize waste discharge to surface and groundwater will lead to practices that will also achieve this management measure. For example, a Grower may choose to change to drill-seed planting, delaying flood irrigation and the use of certain pesticides

Management measure 7, education and outreach. The Order requires that CRC conduct education and outreach activities to inform Growers of program requirements and water quality problems.

⁷³ (<http://water.epa.gov/polwaste/nps/agriculture/agmm_index.cfm>)

Implementation of practices to achieve the Order's water quality requirements described above is consistent with the state and federal guidance for management measures. Because these measures are recommended for similarly situated dischargers (e.g., rice), compliance with the requirements of the Order will lead to implementation of BPTC/best efforts by all Growers.

2. Additional Planning and Implementation Measures (SQMP/GQMPs)

This Order requires development of water quality management plans (surface or groundwater) where degradation trends are observed that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met). SQMPs/GQMPs include requirements to investigate sources, develop strategies to implement practices to ensure waste discharges are meeting the Order's surface and groundwater receiving water limitations, and develop a monitoring strategy to provide feedback on the effectiveness of the management plan. In addition, the SQMPs/GQMPs must include actions to "Identify, validate, and implement management practices to reduce loading of COC's [constituents of concern] to surface water or groundwater, as applicable, thereby improving water quality" (see Appendix MRP-1). Under these plans, additional management practices will be implemented in an iterative manner, to ensure that the management practices represent BPTC/best efforts and that degradation does not threaten beneficial uses. The SQMPs/GQMPs need to meet the performance standards set forth in this Order. The SQMPs/GQMPs are also reviewed periodically to determine whether adequate progress is being made to address the degradation trend or impairment. If adequate progress is not being made, then the Executive Officer can require field monitoring studies, on-site verification of implementation of practices, or the board may revoke the coverage under this Order and regulate the discharger through an individual WDR.

In cases where effectiveness of practices in protecting water quality is not known, the data and information gathered through the SQMP/GQMP and MPEP processes (if applicable) will result in the identification of management practices that meet the performance standards and represent BPTC/best efforts. Since the performance standards also apply to low vulnerability areas with high quality waters, those data and information will help inform the Growers and the Central Valley Water Board of the types of practices that meet performance standard requirements.

It is also important to note that in some cases, other agencies may establish performance standards that are equivalent to BPTC and may be relied upon as part of a SQMP or GQMP. For example, the Department of Pesticide Regulation (DPR) has established Groundwater Protection Areas (GPAs) within the Sacramento Valley Watershed that require growers to implement specific groundwater quality protection requirements for certain pesticides. However, based on the analysis in the GAR, there are no vulnerable areas under rice fields in those GPAs. The practices required under DPR's Groundwater Protection Program are considered BPTC for those pesticides requiring permits in groundwater protection areas, since the practices are designed to prevent those pesticides from reaching groundwater and they apply uniformly to similarly situated dischargers in the area.

The State Water Board indicates in its Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should...evaluate performance data, e.g., through treatability studies..." Water quality management plans, referred to as SQMPs/GQMPs above, institute an iterative process whereby the effectiveness of any set of practices in achieving receiving water limitations will be periodically reevaluated as necessary and/or as more recent and detailed water quality data become available. The monitoring reports and management plan status reports submitted by the CRC on an ongoing basis will include information on the practices being implemented and, for practices implemented in response to SQMPs/GQMPs, an evaluation of their effectiveness. This process of reviewing data and instituting additional practices where necessary will continue to assure that BPTC/best efforts are implemented and will facilitate the collection of information necessary to demonstrate the performance of the practices. This iterative process will also ensure that the highest water quality consistent with maximum benefit to the people of the state will be maintained.

Resolution 68-16 does not require Growers to use technology that is better than necessary to prevent degradation. As such, the board presumes that the performance standards required by this Order are sufficiently achieving BPTC where water quality conditions and management practice implementation are already preventing degradation. Further, since BPTC determinations are informed by the consideration of costs, it is important that discharges in these areas not be subject to the more stringent and expensive requirements associated with SQMPs/GQMP. Therefore, though Growers in “low vulnerability” areas must still meet the farm management performance standards described above, they do not need to incur additional costs associated with SQMPs/GQMPs where there is no evidence of their contributing to degradation of high quality waters.

3. Management Practices Evaluation Program (MPEP) and Other Reporting and Planning Requirements

In addition to the SQMPs/GQMPs, the Order includes a comprehensive suite of reporting requirements that should provide the board with the information it needs to determine whether the necessary actions are being taken to achieve BPTC and protect water quality, where applicable. These reporting provisions have been crafted in consideration of Water Code section 13267, which requires that the burden, including costs, of monitoring requirements bear a reasonable relationship to the need for and the benefits to be gained from the monitoring. If a GQMP is triggered, the CRC must develop and implement a Management Practices Evaluation Program (MPEP), or provide equivalent information in the applicable GQMP. At this time, and based on the CRC’s GAR, no GQMP’s have been triggered and thus a MPEP is not required. However, an MPEP (or equivalent) may be required if new information indicates rice operations may cause or contribute to a groundwater quality problem. The MPEP will include evaluation studies of management practices to determine whether those practices are protective of groundwater quality (e.g., that will not cause or contribute to exceedances of water quality objectives) for identified constituents of concern under a variety of site conditions. If the management practices are not protective, new practices must be developed, implemented, and evaluated. Any management practices that are identified as being protective of water quality, or those that are equally effective, must be implemented by Growers who farm under similar conditions (e.g., soil conditions) (see provision IV.B.21 of the Order).

Farm management performance standards are applicable for all rice lands, even if the area is not under a GQWMP or in a high vulnerability area. If an MPEP is triggered, Growers in low vulnerability areas must implement the applicable practices outlined in the MPEP. Absent any water quality problems triggering a MPEP or GQMP, Growers are still be required to implement practices that achieve the farm management performance standards. The Order, therefore, requires implementation of actions that achieve BPTC and best efforts for both high and low quality waters, respectively.

To determine whether a degradation trend is occurring, the Order requires surface water monitoring of specific monitoring sites on a regular basis. The data gathered from the surface water monitoring effort will allow the board to determine whether there is a trend in degradation of water quality related to discharges from rice lands. For groundwater, a trend monitoring program is required. The trend monitoring is required to help the board determine whether any trend in degradation of groundwater quality is occurring. For pesticides in groundwater, the board will initially rely on the information gathered through the Department of Pesticide Regulation’s (DPR) monitoring efforts to determine whether any degradation related to pesticides is occurring. If the available groundwater quality data (e.g., nitrates, pesticides) in a low vulnerability area suggest that degradation is occurring that could threaten to impair beneficial uses, then a GQMP will be required.

The CRC has submitted a Groundwater Quality Assessment Report (GAR) and will update that report every five years. The GAR includes a process to identify high vulnerability and low vulnerability areas, and concluded that, with known information, rice fields were not located in high vulnerability areas. The GAR includes a compilation of water quality data, which was used to assess rice field operations effect on groundwater quality. Areas with insufficient information, including soils,

hydrogeology, and groundwater monitoring data, were identified and will be examined in the Groundwater Quality Trend Monitoring Workplan. The periodic updates to the GAR will require the consideration of data collected by the CRC, as well as other organizations, and will also allow the board and CRC to evaluate trends. The GAR provides a reporting vehicle for the board to periodically evaluate water quality trends to determine whether degradation is occurring. If the degradation triggers the requirement for a GQMP, then the area in which the GQMP is required would be considered "high vulnerability". If the degradation is for nitrates then Growers in the "high vulnerability" area will be required to prepare and implement a certified Nitrogen Management Plan, and submit a Nitrogen Management Plan Summary Report to the CRC.

All Growers will also need to report on their management practices through the farm evaluation process. In addition, all Growers will need to prepare nitrogen management plans prepared in accordance with the rice-specific nitrogen management plan template approved by the Executive Officer. The plans require Growers to document how their fertilizer use management practices minimize excess nutrient application relative to crop consumption. Through the farm evaluation, the Grower must identify "...on-farm management practices implemented to achieve the Order's farm management performance standards." In addition, the nitrogen management plan summary reports required in high vulnerability areas, if any are identified, will include, at a minimum, information on the ratio of total nitrogen available for crop uptake to the estimated crop consumption of nitrogen. Nitrogen management plans and nitrogen management plan summary reports provide indicators as to whether the Grower is meeting the performance standard to minimize excess nutrient application relative to crop need for nitrogen. The MPEP study process would be used to determine whether the nitrogen consumption ratio meets the performance standard of the Order.

D. Summary

Growers are required to implement practices to meet the above performance standards and periodically review the effectiveness of implemented practices and make improvements where necessary. Growers will identify the practices they are implementing to achieve water quality protection requirements as part of farm evaluations and nitrogen management plans. If high vulnerability areas are subsequently identified, Growers will have additional requirements associated with the SQMPs/GQMPs, implementing applicable practices identified as protective through the MPEP studies; and reporting on their activities more frequently.

Also, the Order requires water quality monitoring and assessments aimed to identify trends, evaluate effectiveness of management practices, and detect exceedances of water quality objectives. The requirements were designed in consideration of Water Code section 13267. The process of periodic review of SQMPs/GQMPs provides a mechanism for the board to better ensure that Growers are meeting the requirements of the Order, if the CRC led efforts are not effective in ensuring BPTC is achieved, where applicable.

Requirements for individual farm evaluations, nitrogen management plans, management practices tracking, and water quality monitoring and reporting are designed to ensure that degradation is minimized and that management practices are protective of water quality. These requirements are aimed to ensure that all rice lands are implementing management practices that minimize degradation, the effectiveness of such practices is evaluated, and feedback monitoring is conducted to ensure that degradation is minimized. Even in low vulnerability areas where there is no information indicating degradation of a high quality water, the farm management performance standards act as a preventative requirement to ensure degradation does not occur. The information and evaluations conducted as part of the GQMP/SQMP process will help inform Growers in low vulnerability areas of the types of practices that meet the performance standards. The farm evaluations and nitrogen management plan requirements for all areas provide indicators as to whether Growers are meeting applicable performance standards. The required monitoring and periodic reassessment of vulnerability designations will allow the board to determine whether degradation is occurring and whether the status of a low vulnerability area should be changed to high vulnerability and vice versa.

The Order is designed to achieve site-specific antidegradation and antidegradation-related requirements through implementation of BPTC/best efforts as appropriate and monitoring, evaluation, and reporting to confirm the effectiveness of the BPTC/best efforts measures in achieving their goals. The Order relies on implementation of practices and treatment technologies that constitute BPTC/best efforts and requires monitoring of water quality and evaluation studies to ensure that the selected practices in fact constitute BPTC where degradation of high quality waters is or may be occurring, and best efforts where waters are already degraded. Because the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through best efforts, the requirements of this Order for BPTC/best efforts apply equally to high quality waters and already degraded waters.

This Order allows degradation of existing high quality waters. This degradation is consistent with maximum benefit to the people of the state for the following reasons:

- At a minimum, this Order requires that rice operations achieve and maintain compliance with water quality objectives and beneficial uses;
- The requirements implementing the Order will result in use of BPTC where rice operational waste discharges may cause degradation of high quality waters; where waters are already degraded, the requirements will result in the pollution controls that reflect the “best efforts” approach. Because BPTC will be implemented, any lowering of water quality will be accompanied by implementation of the most appropriate treatment or control technology;
- Central Valley communities depend on irrigated agriculture for employment, for example the California rice industry annually contributes \$1.8 billion dollars and 25,000 jobs to the state's economy⁷⁴. (PEIR, Appendix A);
- The state and nation depend on Central Valley agriculture for food (PEIR, Appendix A); As stated in the PEIR, one goal of this Order is to maintain the economic viability of agriculture in California’s Central Valley.
- Consistent with the Order’s and PEIR’s stated goal of ensuring that irrigated agricultural discharges do not impair access to safe and reliable drinking water, the Order protects high quality waters relied on by local communities from degradation by current practices on rice lands. The Order is designed to prevent rice operational discharges from causing or contributing to exceedances of water quality objectives, which include maximum contaminant levels for drinking water. The Order imposes more stringent requirements in areas deemed “high vulnerability” based on threat to groundwater beneficial uses, including the domestic and municipal supply use. The Order also is designed to detect and address exceedances of water quality objectives, if they occur, in accordance with the compliance time schedules provided therein,
- Because the Order prohibits degradation above a water quality objective and establishes representative surface water monitoring and groundwater monitoring programs to determine whether rice operational waste discharges are in compliance with the Order’s receiving water limitations, local communities should not incur any additional treatment costs associated with the degradation authorized by this Order. In situations where water bodies are already above water quality objectives and communities are currently incurring treatment costs to use the degraded water, the requirements established by this Order will institute time schedules for reductions in irrigated agricultural sources to achieve the Order’s receiving water limitations; therefore, this Order will, over time, work to reduce treatment costs of such communities; and
- The Order requires Growers to achieve water quality management practice performance standards and includes farm management practices monitoring to ensure practices are

⁷⁴ Economic Contributions of the U.S. Rice Industry to the U.S. Economy. Agricultural & Food Policy Center, Department of Agricultural Economics, Texas AgriLife Research and Extension Service, Texas A&M University, August 2010/

implemented to achieve these standards. The iterative process whereby Growers implement practices to achieve farm management performance standards, coupled with representative surface and groundwater monitoring feedback to assess whether practices are effective, will prevent degradation of surface and groundwater quality above water quality objectives. The requirement that Growers not cause or contribute to exceedances of water quality objectives is a ceiling. Achieving the farm management performance standards will, in many instances, result in preventing degradation or degradation well below water quality objectives.

The requirements of the Order and the degradation that would be allowed are consistent with State Water Board Resolution 68-16. The requirements of the Order will result in the implementation of BPTC necessary to assure the highest water quality consistent with the maximum benefit to the people of the state. The receiving water limitations in section III of the Order, the compliance schedules in section XII, and the Monitoring and Reporting Program's requirements to track compliance with the Order, are designed to ensure that the authorized degradation will not cause or contribute to exceedances of water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. Finally, the iterative process of reviewing data and instituting additional management practices where necessary will ensure that the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

XVIII. California Water Code 13141 and 13241

The total estimated annual cost of compliance with this Order, e.g., summation of costs for administration, monitoring, reporting, tracking, implementation of management practices, is expected to be approximately \$4.03 per acre greater than the cost associated with the protection of surface water only under the Coalition Group Conditional Waiver. The total estimated cost of compliance associated with continuation of the previous Coalition Group Conditional Waiver within the Sacramento Valley for Growers is expected to be approximately 2.13 million dollars per year (\$4.06 per acre annually). The total estimated cost of this Order is 4.25 million dollars per year (\$8.09 per acre annually).

For the above estimates, no costs were assumed to be associated with the implementation of new water quality management practices for Growers. Rice cultivation requires water management for optimum growth and yield of the crop. In addition, several of the rice pesticides require mandatory hold times before release off the field to allow for degradation of the active ingredient. Education and outreach costs were eliminated because a communication system between Growers and the CRC is established. Growers attend board meetings as Growers and receive newsletters that contain information relevant to rice operation, regulation and marketing. The costs for groundwater monitoring in Tier 3 areas (Alternative 4) was eliminated from the cost estimates since very few rice lands are expected to be located in high vulnerability areas due to the physical soil conditions necessary for rice cultivation. The cost estimates include an increase in assessments assuming that the CRC is able to increase assessments based on the statutory approval process required for approval under the Food & Agricultural Code requirements. Such costs in any assessment increase may include costs to prepare the required reports and conduct the required monitoring, as well as annual State Water Board permit fees that are charged to permitted dischargers for permit coverage. In accordance with the State Water Board's Fee Regulations, the current annual permit fee charged to Growers covered by this Order is \$0.75/acre.

This Order, which implements the long-term ILRP for Growers within Sacramento Valley is based mainly on Alternatives 2 and 4 of the PEIR, but does include elements from Alternatives 2-5. The Order contains the third-party lead entity structure, regional surface and groundwater management plans, and regional surface water quality monitoring approach similar to Alternative 2 of the PEIR; farm planning, management practices tracking, nitrogen tracking, and regional groundwater monitoring similar to Alternative 4 of the PEIR; prioritized installation of groundwater monitoring wells similar to Alternative 5; and a prioritization system based on systems described by Alternatives 2 and 4. Therefore, potential costs of the Order are estimated using the costs for these components of Alternatives 2-5 given in Tables

2-19, 2-20, 2-21, and 2-22 of the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (Economics Report).⁷⁵ Estimated costs of management practices are based on costs for Alternatives 2 and 4. Table 6 summarizes the major regulatory elements of the Order and provides reference to the PEIR alternative basis.

Table 6: Summary of regulatory elements

Order elements	Equivalent element from Alternatives 2-5
CRC administration	Alternative 2
Farm evaluation	Alternative 4: farm water quality management plan and certified nutrient management plan
Surface and groundwater management plans	Alternative 2 surface and groundwater management plans
Regional surface water monitoring	Alternative 2 regional surface water monitoring
Regional trend groundwater monitoring	Alternative 4 regional groundwater monitoring
Management practices evaluation program	Alternative 4 regional groundwater monitoring, targeted site-specific studies to evaluate the effects of changes in management practices on groundwater quality and Alternative 5 installation of groundwater monitoring wells at prioritized sites
Management practice reporting	Alternative 4 tracking of practices
Nitrogen management plan summary reporting (if required)	Alternative 4 nutrient tracking
Management practices implementation	Alternative 2 or 4 management practice implementation

The administrative costs of the Order are estimated to be similar to the costs shown for Alternative 2 in Table 2-19 of the Economics Report. The farm evaluation (farm plans) costs are estimated to be similar to the costs shown for Alternative 4 for farm planning (page 2-22, Economics Report). Total surface water monitoring and reporting costs are estimated to be similar to the costs shown for Alternative 2 – essentially a continuation of the current regional surface water monitoring approach. Total regional groundwater monitoring and reporting costs are estimated to be similar to the costs shown for Alternative 4 in Table 2-21 of the Economics Report minus the “Tier 3 individual monitoring.” Costs for installation of groundwater monitoring wells are estimated to be similar to the costs shown for Alternative 5 in Table 2-22 of the Economics Report. Tracking costs of management practices and nitrogen management plan information are estimated to be similar to the costs shown for Alternative 4 in Table 2-21 of the economics report – under “tracking.” Estimated average annualized costs per acre of the Order relative to full implementation of the current waiver program for Growers in the Sacramento Valley (per acre costs based on 525,000 rice acres in the Sacramento Valley irrigated agricultural lands of 2,286,395 acres) are summarized below in Table 7.

Table 7: Estimated annual average per acre cost of the Order relative to full implementation of the current program (PEIR Alternative 1) for Rice Growers in the Sacramento Valley

	Order	Current program	Change
Administration	1.37	1.09	0.28
Farm plans	0.71	--	0.73
Monitoring/reporting/tracking	1.43	0.46	0.97
Management practices	4.59	2.51	2.07
Total	8.09	4.06	4.03

* Costs are an estimate of *potential*, not required costs of implementing specific practices.

† Totals may not add up due to rounding.

⁷⁵ ICF International. 2010. *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program*. Draft. July. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA

The Sacramento and San Joaquin River Basin Plan includes an estimate of potential costs and sources of financing for the long-term irrigated lands program. The estimated costs were derived by analyzing the alternatives evaluated in the PEIR using the cost figures provided in the Economics Report. The Basin Plan cost estimate is provided as a range applicable to implementation of the program throughout the Central Valley. The Basin Plan's estimated total annualized cost of the irrigated lands program is \$216 million to \$1.3 billion, or \$27 to \$168 per acre.⁷⁶ The estimated total annual cost of this Order of \$4.2 million dollars (\$8.09 per acre) falls below the estimated cost range for the irrigated lands program as described in the Sacramento and San Joaquin River Basin Plan when considering per acre costs (\$27-\$168 per acre).

The Order, based substantially on Alternative 4, has lower estimated costs than described in the Economics Report. Rice growers have implemented water quality management practices as part of their operations, such as leveling of fields to control water flow, mandatory pesticide hold times to allow for degradation, compaction of surrounding levees to minimize water seepage, and water management practices to ensure optimum crop growth and yield. Implementation of additional management practices will be minimized or non-existent. Because nitrogen fertilizers, in the form of ammonium sulfate or liquid ammonia, are generally injected into the soil and immediately flooded, nitrogen management is not expected to be a major water quality problem. If added as a top dressing, nitrogen is not expected to leave the flooded fields nor leach through the low permeability soil typically found in rice fields.

XIX. California Water Code Section 13263

California Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.

(a) Past, present, and probable future beneficial uses of water

The Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan) identifies applicable beneficial uses of surface and groundwater within the Sacramento River Basin. The Order protects the beneficial used identified in the Basin Plan. Applicable past, present, and probable future beneficial uses of Sacramento River Basin waters were considered by the Central Valley Water Board as part of the Basin Planning process and are reflected in the Basin Plans themselves. The Order is a general order applicable to a wide geographic area. Therefore, it is appropriate to consider beneficial uses as identified in the Basin Plan and applicable policies, rather than a site specific evaluation that might be appropriate for WDRs applicable to a single discharger.

(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto

Environmental characteristics of the Sacramento River Basin have been considered in the development of rice lands program requirements as part of the Central Valley Water Board's 2008 *Irrigated Lands Regulatory Program Existing Conditions Report* and the PEIR. In addition, the GAR includes a discussion of the environmental conditions associated with rice operations in the Sacramento Valley. In these reports, existing water quality and other environmental conditions throughout the Central Valley have been considered in the evaluation of six program alternatives for regulating waste discharge from irrigated lands. The Order's requirements are based on the alternatives evaluated in the PEIR.

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area

The Order provides a process to review these factors during implementation of water quality management plans (SQMPs/GQMPs). The Order requires that discharges of waste from rice lands to surface water and groundwater do not cause receiving waters to exceed applicable water quality

⁷⁶ Per acre average cost calculated using an estimate for total irrigated agricultural acres in the Central Valley (7.9 million acres, Table 3-3, Economics Report).

objectives. SQMPs and GQMPs are required in areas where water quality objectives are not being met, where rice fields are a potential source of the concern, and in areas where rice fields may be causing or contributing to a trend of degradation that may threaten applicable beneficial uses. GQMPs are also required in high vulnerability groundwater areas. Under these plans, sources of waste must be estimated along with background water quality to determine what options exist for reducing waste discharge to ensure that rice lands are not causing or contributing to the water quality problem. The SQMPs and GQMPs must be designed to ensure that waste discharges from rice lands do not cause or contribute to an exceedance of a water quality objective and meet other applicable requirements of the Order, including, but not limited to, section III.

(d) *Economic considerations*

The PEIR was supported by the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (Economics Report). An extensive economic analysis was presented in this report to estimate the cost and broader economic impact on irrigated agricultural operations associated with the five alternatives for the irrigated lands program, including the rice lands regulated by this Order. Central Valley Water Board staff was also able to use that analysis to estimate costs of a sixth alternative, since the sixth alternative fell within the range of the five alternatives. This cost estimate is found in Appendix A of the PEIR. The Order is based on the alternatives evaluated in the PEIR, which is part of the administrative record. Therefore, potential economic considerations related to the Order have been considered as part of the overall economic analysis for implementation of the long-term irrigated lands regulatory program. The Order is a single action in a series of actions to implement the ILRP in the Central Valley region. Because the Order has been developed from the alternatives evaluated in the PEIR, economic effects will be within the range of those described for the alternatives.

One measure considered in the PEIR is the potential loss of Important Farmland⁷⁷ due to increased costs. This information has been used in the context of the Order to estimate potential loss of productive rice lands. As described in Attachment D of the Order, it is estimated that there will not be any loss of productive rice lands due to the costs imposed by the Order (see section IV.A of Attachment D).

(e) *The need for developing housing within the region*

The Order establishes waste discharge requirements for rice lands in the Sacramento Valley. The Order is not intended to establish requirements for any facilities that accept wastewater from residences or stormwater runoff from residential areas. The Order will not affect the development of housing within the region.

(f) *The need to develop and use recycled water*

The Order does not establish any requirements for the use or purveyance of recycled wastewater. Where a rice operation may have access to recycled wastewater of appropriate quality for application to rice fields, the operation would need to obtain appropriate waste discharge requirements from the Central Valley Water Board prior to initiating use. This need to obtain additional waste discharge requirements in order to use recycle wastewater on rice fields instead of providing requirements under the Order may complicate potential use of recycled wastewater on rice fields. However, the location of rice fields in rural areas generally limits access to large volumes of appropriately treated recycled wastewater. As such, it is not anticipated that there is a need to develop general waste discharge requirements for application of recycled wastewater on rice fields in the Sacramento Valley.

⁷⁷ Important Farmland is defined in the PEIR as farmland identified as prime, unique, or of statewide importance by the California Department of Conservation, Farmland Mapping and Monitoring Program.

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

**ATTACHMENT B TO ORDER NO. R5-2014-0032
MONITORING AND REPORTING PROGRAM**

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
SACRAMENTO VALLEY RICE GROWERS**

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I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to the California Water Code (Water Code) Section 13267 which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board or “board”) to require preparation and submittal of technical and monitoring reports. This MRP includes requirements for a third-party representative, the California Rice Commission (CRC), to assist individual rice land operators or owners that are Growers¹ subject to and enrolled under Waste Discharge Requirements General Order for Rice Growers within the Sacramento Valley, Order R5-2014-0032 (hereafter referred to as the “Order”). The requirements of this MRP are necessary to monitor Grower compliance with the provisions of the Order and determine whether state waters receiving discharges from rice lands are meeting water quality objectives. Additional discussion and rationale for this MRP’s requirements are provided in Attachment A of the Order.

This MRP establishes specific surface and ground water monitoring, reporting, and electronic data deliverable requirements for the CRC. Due to the nature of agricultural operations, monitoring requirements for surface waters and groundwater will be periodically reassessed to determine if changes should be made to better represent rice field discharges to state waters. The monitoring schedule will also be reassessed so that constituents are monitored during application and/or release timeframes when constituents of concern are most likely to affect water quality. The CRC shall not implement any changes to this MRP unless the Central Valley Water Board or the Executive Officer issues a revised MRP. The Central Valley Water Board or Executive Officer may revise this MRP as it applies to the CRC or Growers governed by the Order. The Central Valley Water Board or Executive Officer may rescind this MRP and issue a new MRP as it applies to the CRC or Growers governed by the Order.

II. General Provisions

This Monitoring and Reporting Program (MRP) conforms to the goals of the Non-point Source (NPS) Program as outlined in *The Plan for California’s Nonpoint Source Pollution (NPS) Program* by:

- tracking, monitoring, assessing and reporting program activities,
- ensuring consistent and accurate reporting of monitoring activities,
- targeting NPS Program activities for rice at the watershed level,
- coordinating with public and private partners, and
- tracking implementation of management practices to improve water quality and protect existing beneficial uses.

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data. The CRC must follow sampling and analytical procedures as specified in Attachment C, Order No. R5-2010-0805, Monitoring and Reporting Program for California Rice Commission, Quality Assurance Program Plan Guidelines (QAPP Guidelines) and any revisions thereto approved by the Executive Officer.²

To the extent feasible, all technical reports required by this MRP must be submitted electronically in a format specified by the Central Valley Water Board that is reasonably available to the CRC.

¹ Grower(s) is defined to mean a producer of rice as defined in California Food and Agriculture Code, section 71032, or a landowner that leases, rents, or otherwise owns land that is used by a producer of rice. For both producers of rice and landowners, the land in question must be located within the Sacramento Valley, which includes the counties of Sacramento, Sutter, Yuba, Butte, Glenn, Colusa, Yolo, Placer, and Tehama.

² The CRC has an approved QAPP that meets the conditions of Attachment C, Order No. R5-2010-0805, and was submitted according to MRP requirements.

Because the CRC is a commodity-specific coalition group, monitoring requirements have been specifically designed for rice discharges. Since monitoring locations will overlap with another coalition group, the CRC is encouraged to work with the other third-party entity to determine the source and identity of contaminants of concern for surface and groundwater that may have a rice lands contribution.

This MRP requires the CRC to collect information from its Growers and allows the CRC to report the information to the board in a format that does not identify individual Growers and their parcels. The CRC must submit parcel specific information collected as specified in the Order (see Section VIII.A. of the WDR).

This MRP Order becomes effective on **DATE**. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the effective date of this MRP, the CRC, on behalf of the individual Growers, shall implement the following monitoring and reporting.

III. Surface Water Monitoring Requirements

A. Surface Water Monitoring Sites

The CRC has established four primary locations (see Table 1) as representative of rice field discharges. Secondary sites, upstream from the primary sites, have been used in the Irrigated Lands Regulatory Program (ILRP) to confirm representativeness of the primary sites. Monitoring of the primary and secondary sites will continue in this MRP.

Table 1. CRC Monitoring Sites

Site Type	Site ID	Site Name	Station Code	Latitude	Longitude
Primary	CBD5	Colusa Basin Drain #5	520XCBDWR	39.1833 N	-122.0500 W
Primary	BS1	Butte Slough at Lower Pass Rd	520XBTTSL	39.1875 N	-121.9000 W
Primary	CBD1	Colusa Basin Drain above Knights Landing	520XCBDKL	38.8125 N	-121.7731 W
Primary	SSB	Sacramento Slough Bridge near Karnak	520XSSLNK	38.7850 N	-121.6533 W
Secondary	F	Lurline Creek; upstream site for CBD5	520CRCLCF	39.2184 N	-122.1511 W
Secondary	G	Cherokee Canal, upstream site for BS1*	520CRCCCG	39.3611 N	-121.8675 W
Secondary	H	Obanion Outfall at DWR PP on Obanion Rd, upstream site for SSB	520CRCOOH	39.0258N	-121.7272 W

B. Types of Surface Water Monitoring

Surface water monitoring must provide sufficient data to describe rice operations' impacts on surface water quality and determine whether existing or newly implemented management practices comply with the receiving water limitations of this Order. Surface water monitoring shall include three types of monitoring conducted on a five year rotation (Table 2). The monitoring types are described below.

1. Assessment monitoring

Assessment monitoring shall include field and general parameters, nutrients (nitrate + nitrite as nitrogen and total ammonia as nitrogen), at least two pesticides identified by CRC after evaluation and assessment as specified in Section III.C., and water column and sediment toxicity testing (Table 3). The Executive Officer may require monitoring of more than two pesticides if the Executive Officer determines that insufficient information is available to assess the potential threat to water quality of a pesticide or that available information suggests there could be a water quality

threat associated with a pesticide³. The pesticides shall be monitored twice during their peak use month and twice in the following month. Sediment toxicity, sediment TOC and grain size testing shall occur once during the pre-harvest drainage. The monitoring schedule for each pesticide shall be tailored to the peak use and/or time periods when the pesticides (respectively) are likely to be discharged to surface water. Water column toxicity testing with *Ceriodaphnia dubia* and *Pimephales promelas* shall occur during two monthly events when pesticides are monitored. For *Selenastrum capricornutum*, toxicity testing shall start during the month when pesticides are first applied and continue for a total of three months. Assessment monitoring shall begin when most rice fields start pesticides application and end with the harvest drainage.

2. Modified assessment monitoring

Modified assessment monitoring shall include the field and general parameters, nutrients, and two pesticides (Table 3) selected based on results from the prior assessment year. The two selected pesticides shall be monitored twice during their peak use month and twice in the following month. The monitoring schedule for each pesticide shall be tailored to the peak use and/or time periods when the respective pesticides are likely to be discharged to surface water. The monitoring period shall be for at least two months of the growing season⁴.

3. Core monitoring

Core monitoring shall include field parameters and two selected indicator rice pesticides (Table 3). Monitoring of the indicator pesticides shall be based on a pesticide evaluation and assessment as specified in Section III.C. Monitoring shall occur two times during one month of each indicator pesticides' peak use period.⁵

The schedule begins with assessment monitoring, followed by a year of modified assessment monitoring, followed by three years of core monitoring, as shown in Table 2. This cycle is continuous until a revised MRP is adopted by the board or approved by the Executive Officer. All sites, primary and secondary, are included in assessment and modified assessment monitoring. Only primary sites are sampled during core monitoring. The schedule for monitoring for each parameter is discussed in the Section III.D.

³ For example, a change in use patterns or practices may make it more likely that the pesticide could be above water quality objectives or concentrations of the pesticide in surface waters could be increasing (a trend of degradation).

⁴ Since the selected pesticides are each monitored during the month of peak use/application and the following month, the monitoring period for modified assessment sampling may be more than two months of the growing season.

⁵ Since each indicator pesticide is monitored during the month of peak use/application, the monitoring period for core sampling may be more than one month of the growing season.

Table 2. ILRP Monitoring Type and Schedule

Year	Monitoring Type	Monitored for the Year						
		CBD5	CBD1	BS1	SSB	F	G	H
2015	Assessment	X	X	X	X	X	X	X
2016	Modified assessment	X	X	X	X	X	X	X
2017	Core	X	X	X	X			
2018	Core	X	X	X	X			
2019	Core	X	X	X	X			
2020	Assessment	X	X	X	X	X	X	X
2021	Modified assessment	X	X	X	X	X	X	X

C. Surface Water Monitoring Parameters

Table 3 lists the monitoring types and parameters that must be performed during assessment, modified assessment, and core years. The schedule and frequency for monitoring are discussed in the next section. Monitoring performed under a management plan must be identified when a new surface water quality management plan is submitted (see MRP-1, Management Plan Requirements). The Executive Officer may require a parameter(s) of concern continue to be monitored at a specific site during a year that parameter would normally not be scheduled to be monitored. Parameters of concern may include, but are not limited to, parameters that exceed an applicable water quality objective or water quality trigger (see Section VII).

1. Pesticide monitoring

Pesticides to be monitored are based on an evaluation of the previous years' monitoring results, whether changes in the pesticide usage has occurred (e.g., number of acres applied); and the most recent rice pesticide evaluation (see Section V.C. of this MRP Order). The CRC shall propose the pesticides⁶ to be monitored in their Annual Monitoring Report and provide the rationale for their proposal. The pesticides to be monitored shall be reviewed as part of a rice-specific process by Water Board staff that includes input from qualified scientists and coordination with the Department of Pesticide Regulation. Once the list is approved by the Executive Officer, the CRC shall monitor the list of pesticides in accordance with the terms and conditions of this MRP.

⁶ Pesticides to be monitored may include environmentally stable degradates of the registered active ingredient. The evaluation factors applied to degradates will be the same as those applied to the registered active ingredient and will include consideration of the commercial availability of analytical methods to detect the degradate. Potential degradates to evaluate will be identified through Central Valley Water Board and CRC consultation with the Department of Pesticide Regulation.

Table 3. CRC Surface Water Monitoring Parameters for each Monitoring Type

Monitoring Type	Assessment	Modified Assessment	Core
Sites	Primary and Secondary	Primary and Secondary	Primary
Field measurements^a Flow pH Electrical conductivity Dissolved oxygen (DO) Temperature	X	X	X
General physical parameters^a Turbidity Total organic carbon (TOC) Total suspended solids (TSS)	X	X	
Nutrients^a Nitrate + nitrite as nitrogen Total ammonia as nitrogen	X	X	
Photo monitoring (digital)	To be taken initially, and as needed to document site changes that could affect monitoring results		
Pesticides Pesticides to be determined after evaluation per III.C.	X	X	X
Water column toxicity <i>Selenastrum capricornutum</i>	X		
<i>Ceriodaphnia dubia</i>	X		
<i>Pimephales promelas</i>	X		
Sediment toxicity Hyalella azteca	X		
Sediment TOC	X		
Grain size	X		
Pesticides in sediment (s) cypermethrin λ- cyhalothrin	As needed		

^a Monitoring to include all parameters listed.

D. Surface Water Monitoring Schedule and Frequency

Monitoring shall be based on the timing and frequency of pesticide application and discharge from rice fields that may contain constituents that affect water quality. The monitoring period for a constituent is based on when the constituent is most likely to be discharged. Each year the monitoring start date shall account for factors such as weather conditions, planting dates, and/or pesticide application based on consultation with county agricultural commissioners, growers, pest control advisors, UC Cooperative Extension, and the Central Valley Water Board staff. The monitoring start date and schedule for a constituent may vary from year to year.

Table 4 shows the monitoring schedule and frequency required for surface water. Pesticides to be monitored, as approved by the Executive Officer based on the pesticide evaluation submitted, are to be monitored during the months when peak application and/or release occur.

Table 4. Surface Water Monitoring Schedule and Frequency

Monitoring Type	Assessment	Modified Assessment	Core
Sites	Primary and Secondary	Primary and Secondary	Primary
Field measurements Flow pH Electrical conductivity Dissolved oxygen (DO) Temperature	Concurrent with all sampling events	Concurrent with all sampling events	Concurrent with all sampling events
General physical parameter Turbidity Total organic carbon (TOC) Total suspended solids (TSS)	Two monthly sampling events	Two monthly sampling events	N/A
Nutrients Nitrates + nitrites as nitrogen Total ammonia as nitrogen	Two monthly events during growing season	Two monthly events during growing season	N/A
Photo monitoring (digital)	Beginning of the monitoring season and as needed (e.g., changes in site location due to inaccessibility, or to document site conditions)		
Pesticides To be determined from evaluation	Two (2) sampling events during the month of peak application, two (2) sampling events in the month following peak application		Two (2) sampling events during the month of peak application
Water column toxicity <i>Selenastrum capricornutum</i>	Three monthly sampling events starting with pesticide monitoring	N/A	N/A
<i>Ceriodaphnia dubia</i> <i>Pimephales promelas</i>	Two monthly events starting with pesticide monitoring	N/A	N/A
Sediment toxicity Hyalella azteca Sediment TOC Grain size	One sampling event during pre-harvest drainage	N/A	N/A
Sediment pesticides (s) cypermethrin λ- cyhalothrin	Analyzed only if sediment toxicity observed	N/A	N/A

E. Toxicity Testing

The purpose of toxicity testing is to evaluate compliance with the Basin Plan narrative toxicity water quality objective; identify the causes of toxicity when and where it is observed (e.g., metals, pesticides, ammonia, etc.); and evaluate any additive toxicity or synergistic effects due to the presence of multiple constituents.

1. Water Column Toxicity Testing

Water column toxicity testing shall include *Ceriodaphnia dubia* (water flea), *Pimephales promelas* (fathead minnow), and *Selenastrum capricornutum* (green algae) according to the schedule in Table 4 and shall follow the USEPA methods for acute (*C. dubia* and *P. promelas*) and chronic (*S. capricornutum*) toxicity testing^{7,8}. Toxicity endpoints are survival for *C. dubia* and *P. promelas*, and growth for *S. capricornutum*.

⁷ USEPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, Office of Water, Washington, D.C. USEPA-321-R-02-012.

Water column toxicity analyses shall be conducted on 100% (undiluted) sample for the initial screening. Adequate sample volume must be collected at each site to allow for the toxicity test and any subsequent analysis (dilution series, Toxicity Identification Evaluation [TIE] or pesticide analyses) required by the toxicity test results.

If within the first 96 hours of the initial toxicity screening the mortality reaches 100%, a multiple dilution test shall be initiated. The dilution series must be initiated within 24 hours of the sample reaching 100% mortality, and must include a minimum of five (5) sample dilutions to quantify the magnitude of the toxic response. For the *P. promelas* test, the laboratory must take the steps to procure test species within one working day, and the multiple dilution tests must be initiated the day fish are available.

For *C. dubia* or *P. promelas*, if a 50% or greater difference in mortality in an ambient sample (compared to the laboratory control) is detected at any time in an acceptable test, a TIE or pesticide analyses shall be initiated within 48 hours of such detection. Before the start of the rice monitoring season, but no later than 1 March, the CRC will select the follow-up action (TIE or pesticide analyses) for a 50% or greater difference in mortality and notify the Central Valley Water Board. If the follow-up action selected is to conduct pesticide analysis, a list of pesticides to be analyzed will be developed by the CRC and approved by Central Valley Water Board staff before the monitoring season.

If a 50% or greater reduction in *S. capricornutum* growth in an ambient sample, as compared to the laboratory control, is detected at the end of an acceptable test, a copper/hardness and pesticide analyses shall be initiated within 48 hours from the end of the test.

The pesticide(s) to be analyzed triggered by the 50% or greater reduction in *S. capricornutum* growth, shall be determined based on the CRC and Central Valley Water Board staff evaluation of the pesticides being used before the sampling date, the degradation rate, hold times, and the physical and chemical properties of the pesticides and degradation products. The CRC shall institute procedures (i.e., immediate notification when trigger reached) that ensures the pesticide analysis is performed within the required hold time for the lab method.

Ceriodaphnia dubia and *Pimephales promelas* Media Renewal

Daily sample water renewals shall occur during all acute toxicity tests to minimize the effects of rapid pesticide losses from test waters. A feeding regime of 2 hours before test initiation and 2 hours before test renewal shall be applied. Test solution renewal must be 100% renewal for *C. dubia* by transferring organisms by pipet into fresh aliquot of the original ambient sample, as defined in the freshwater toxicity testing manual.

Selenastrum capricornutum Pre-Test Treatment

Algae toxicity testing shall not be preceded with treatment of the chelating agent EDTA. The purpose of omitting this agent is to ensure that metals used to control algae in the field are not removed from sample aliquots before analysis or during the initial screening.

2. Sediment Toxicity

Sediment toxicity analyses shall be conducted according to EPA Method 600/R-99/064.⁹ Sampling and analysis for sediment toxicity testing utilizing *Hyalella azteca* (*freshwater amphipod also known as Mexican scud*) shall be conducted at each monitoring location established by the CRC for water quality monitoring, if appropriate sediment (i.e. silt, clay) is present at the site. If

⁸ USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. USEPA-821-R-02-013.

⁹ USEPA, 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition, Office of Water, Washington, D.C. EPA 600/R-99/064.

appropriate sediment is not present at the designated water quality monitoring site, an alternative site with appropriate sediment shall be designated for all sediment collection and toxicity testing events. Sediment samples shall be collected and analyzed for toxicity during the pre-harvest drainage. The *H. azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a SQMP.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. The sediment collected for grain size analysis shall not be frozen. If the sample is not toxic to the test species, the additional sample volume can be discarded.

Sediment samples that show significant toxicity to *Hyaella azteca* at the end of an acceptable test and that exhibit $\geq 20\%$ reduction in organism survival compared to the control require the two pesticide analyses ([s] cypermethrin and λ -cyhalothrin) of the same sample. Analysis at practical reporting limits of 1 ng/g on a dry weight basis for each pesticide is required to allow comparison to established lethal concentrations of these chemicals to the test species. This follow-up analysis must begin within five business days of when the toxicity criterion described above is exceeded. The CRC may also follow up with sediment TIE when there is $\geq 50\%$ reduction in test organism survival as compared to the laboratory control. Sediment TIEs are an optional tool.

F. Special Project Monitoring

The Central Valley Water Board or Executive Officer may require the California Rice Commission to conduct local or site-specific monitoring where monitoring identifies a water quality problem (Special Project Monitoring). The studies shall be representative of the effects of changes in management practices for the parameters of concern. Once Special Project Monitoring is required, the California Rice Commission must submit a Special Project Monitoring proposal. The proposal must provide the justification for the proposed study design, specifically identifying how the study design will quantify rice operations' contribution to the water quality problem, identify sources, and evaluate management practice effectiveness. When such a study is required, the proposed study must include an evaluation of the feasibility of conducting management practice specific field studies that could be associated with the pollutants of concern. Special Project Monitoring studies will be designed to evaluate the effectiveness of practices used by multiple Growers and will not be required of the California Rice Commission to evaluate compliance of an individual Grower.

G. Surface Water Data Management Requirements

All surface water field and laboratory data (including sediment) must be submitted electronically to the ILRP in the required templates. The CRC shall ensure that the most current version of the templates are being utilized. Required formatting and business rules for field, chemistry and toxicity data are detailed within the respective template instruction manuals (see below). These manuals are maintained in collaboration with the Central Valley Regional Data Center (CV RDC) to ensure comparability with the California Environmental Data Exchange Network (CEDEN). In addition to the use of required templates for field, chemistry, and toxicity data, the CRC shall maintain an electronic version of their approved Quality Assurance Project Plan (eQAPP). Detailed electronic water quality data submittal requirements are provided in Section III.G of this MRP Order. Note that electronic copies (e.g. PDF) of all original field sheets, field measurement instrumentation calibration logs, chain of custody forms and laboratory reports must be included in the electronic data submittal.

Once data have been submitted to the ILRP, the data will undergo a series of reviews for adherence to the required formatting and business rules. The data will also be reviewed for the required quality control elements as detailed within the CRC's eQAPP. The CRC will be notified of any changes made to the dataset to successfully load the data. If significant changes are found to be needed, the dataset will be returned to the CRC for revision. Once the data sets have been reviewed and corrected, if needed, the data will be uploaded by the ILRP into a CV RDC CEDEN comparable database. The dataset will then undergo a final set of reviews to ensure completeness and then be transferred to CEDEN for public access.

A narrative describing each required template is provided below. Links to the required templates, instruction manuals and optional tools are available on the ILRP Electronic Water Quality Monitoring Data Submission Resources webpage:

http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/electronic_data_submission/

Field Data Template (Required)

The CRC shall input all site visit information and field measurement results into the field data template, which is an Excel workbook. Site visit information (Location and Habitat) must be recorded for any site visit conducted to comply with the requirements in this Order, including events when a site is dry. The field data template contains three required worksheets (Locations, FieldResults, HabitatResults) and four optional worksheets (Stations, FundingCode, GroupCode and Personnel). An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

Chemistry Data Template (Required)

The CRC shall input all chemistry analysis and associated quality control information into the chemistry data template, which is an Excel workbook. The chemistry data template contains two required worksheets: Results and LabBatch. An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

Toxicity Data Template (Required)

The CRC shall input all toxicity analysis and associated quality control information, with the exception of reference toxicity analyses, into the toxicity data template, which is an Excel workbook. The toxicity data template contains three required worksheets: Results, Summary, and ToxBatch. An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

Electronic Quality Assurance Program Plan (eQAPP) (Required)

The eQAPP is an Excel workbook containing a worksheet of the quality control requirements for each analyte and method as detailed in the most current version of the CRC's approved QAPP. The eQAPP workbook will also include additional worksheets containing references for applicable codes, CEDEN retrieval information, and other project specific information. The ILRP has already provided the CRC an eQAPP associated with their previously approved QAPP. The CRC shall be responsible for updating the Quality Control worksheet to the most current approved QAPP. Each analyte, method, extraction, units, recovery limits, QA sample requirement, etc. are included in this document using the appropriate codes required for the CEDEN comparable database. This information should be used to conduct a quality control review prior to submission. Data that does not meet the project quality assurance acceptance requirements must be flagged accordingly and include applicable comments.

The ILRP and CV RDC have also developed several optional tools to assist the CRC. Links to these tools, unless otherwise noted, are available on the ILRP Electronic Data Submission webpage.

Field Sheet Template (Optional)

An example of a CEDEN comparable field sheet can be found on the ILRP webpage. This field sheet was designed to match the entry user interface within the CEDEN comparable database to allow for easier data entry of all sample collection information.

CV RDC Field Entry Shell Database (Optional)

The CV RDC Field Entry Shell Database is a copy of the CV RDC database infrastructure that provides a user interface for site visit and field measurements data entry only. The shell database may be used by those who prefer to enter field data through a user interface rather than directly into the required Excel template. The database provides an export function that can populate the required CV RDC field data template with the data entered. The populated template is then required to be submitted to the ILRP. The shell database may not be used for entry of chemistry or toxicity data. A

custom field entry shell database may be obtained by contacting the CV RDC:
<http://mlj-llc.com/contact.html>.

Format Quick Guide (Optional Tool)

The Format Quick Guide is a guidance document developed to aid the CRC with data entry and can be used as a reference tool for commonly used codes necessary for populating the required data entry templates. The ILRP will provide this document, and updates to it, upon request.

EDD Checklist with example Pivots (Optional Tool)

The electronic data deliverable (EDD) checklist provides for a structured method for reviewing data deliverables from data entry staff or laboratories before loading. Example pivot tables are provided to assist with the review of the data. Documentation on how to use the checklist and associated pivot tables is available on the ILRP Electronic Data Submission webpage.

Online Data Checker (Optional Tool)

An online data checker was developed to automate the checking of the datasets against many of the format requirements and business rules associated with CEDEN comparable data. The data checker can be accessed through the ILRP Electronic Data Submission webpage. Please note that data submission will not be accepted through this tool; however, the checker can still be used to check data for formatting and business rule compliance.

IV. Groundwater Quality Monitoring and Management Practice Assessment, and Evaluation Requirements

The groundwater quality monitoring, assessment, and evaluation requirements in this MRP have been developed in consideration of the critical questions developed by the Groundwater Monitoring Advisory Workgroup (questions are presented in the Information Sheet, Attachment A). The CRC must collect sufficient data to describe impacts on groundwater quality from rice operations and to determine whether existing or newly implemented management practices comply with the groundwater receiving water limitations of the Order.

The GAR submitted by the CRC did not identify any impacts on groundwater quality that would require the development of a Management Practices Evaluation Program. However, should such impacts be identified, a Management Practices Evaluation Program, or equivalent, that meets the requirements identified below must be prepared. In addition, although a Rice GAR has been submitted, the GAR requirements will apply to updates to the submitted GAR.

The strategy for evaluating groundwater quality and protection consists of 1) Groundwater Assessment Report, 2) Management Practices Evaluation Program, and 3) Groundwater Quality Trend Monitoring Program.

1. The Groundwater Quality Assessment Report (GAR) provides the foundational information necessary for design of the Management Practices Evaluation Program and the Groundwater Quality Trend Monitoring Program. The GAR also identifies the high vulnerability groundwater areas where a Groundwater Quality Management Plan must be developed and implemented, as well as data gap areas for further evaluation. A GAR that satisfies the requirements outlined in IV.A below was submitted by CRC to the board in July 2013.
2. The overall goal of the Management Practice Evaluation Program (MPEP) is to determine the effects, if any, rice operation practices have on groundwater under different conditions that could affect the discharge of waste from rice operations to groundwater (e.g., soil type, depth to groundwater, irrigation practice, nutrient management practice). A MPEP, or equivalent evaluation program described in the applicable Groundwater Quality Management Plan (GQMP), is required when a GQMP must be prepared (see Section VIII.F of the Order).

3. The overall objectives of the Groundwater Quality Trend Monitoring Program are to determine current water quality conditions of groundwater relevant to rice operations and develop long-term groundwater quality information that can be used to evaluate the regional effects of practices associated with rice growing operations.

Each of these elements has its own specific objectives (provided below), and the design of each will differ in accordance with the specific objectives to be reached. While it is anticipated that these programs will provide sufficient groundwater quality and management practice effectiveness data to evaluate whether management practices associated with rice operations are protective of groundwater quality, the Executive Officer may also, pursuant to Water Code section 13267, order Growers to perform additional monitoring or evaluations, where violations of this Order are documented or the rice operation is found to be a significant threat to groundwater quality.

A. Groundwater Assessment Report

The purpose of the Groundwater Quality Assessment Report (GAR) is to provide the technical basis informing the scope and level of effort for implementation of the Order's groundwater monitoring and implementation provisions. The CRC submitted a draft Groundwater Assessment Report (GAR) in April 2012 for staff review and comment. The final GAR, dated July 2013, was submitted to the board and satisfies the requirements described in this section.

The CRC must review and update the GAR to incorporate new information every five (5) years after board adoption of the Order. The requirements below apply to the updates or addenda to the GAR.

1. *Objectives.* The main objectives of the updates to the GAR are to:
 - Provide an assessment of all newly available, applicable and relevant data and information to identify changes to high and low vulnerability areas where discharges from rice operations may result in groundwater quality degradation.
 - Establish priorities for implementation of monitoring and studies within high vulnerability areas, if applicable.
 - Provide an assessment to determine whether the existing workplan to assess groundwater quality trends are still applicable based on the new data and observations.
 - Provide an assessment to determine whether the existing workplans and priorities to evaluate the effectiveness of agricultural management practices to protect groundwater quality are still applicable based on the new data and observations.
 - Provide a basis for establishing groundwater quality management plans if high vulnerability areas are identified during the updates analysis and priorities for implementation of those plans.
2. *GAR Update components.* The updated GAR or GAR addenda shall include, at a minimum, consideration of updates to the following data components:
 - Detailed land use information with emphasis on land uses associated with rice operations.
 - Information regarding depth to groundwater, provided as a contour map(s).
 - Groundwater recharge information, including identification of areas contributing recharge to urban and rural communities where groundwater serves as a significant source of supply.
 - Soil survey information, including significant areas of high salinity, alkalinity and acidity.
 - Shallow groundwater constituent concentrations (potential constituents of concern include any material applied as part of the agricultural operation, including constituents in irrigation supply water [e.g., pesticides, fertilizers, soil amendments, etc.] that could impact beneficial uses or cause degradation).
 - Information on existing groundwater data collection and analysis efforts relevant to this Order (e.g., Department of Pesticide Regulation [DPR] United States Geological Survey [USGS] State Water Board Groundwater Ambient Monitoring and Assessment [GAMA], California Department of Public Health, local groundwater management plans, etc.). This groundwater data compilation and review shall include readily accessible information relative to the Order on existing

monitoring well networks, individual well details, and monitored parameters. For existing monitoring networks (or portions thereof) and/or relevant data sets, the CRC should assess the possibility of data sharing between the data-collecting entity, the CRC, and the Central Valley Water Board.

- A review of the results obtained from the rice-specific trend monitoring network data sampling,

3. *GAR Update/Addenda data review and analysis.* To develop the above data components, the GAR Update/Addenda shall include review and use, where applicable, of relevant updated and new existing federal, state, county, and local databases and documents. The GAR Update/Addenda shall include an evaluation of the above data components to:

- Determine where new information indicates groundwater quality impacts for which rice operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from rice growing activities.
- Determine the merit and feasibility of incorporating additional existing, relevant groundwater data collection efforts, and their corresponding monitoring well systems for obtaining appropriate groundwater quality information to achieve the objectives of and support groundwater monitoring activities under this Order. This shall include specific findings and conclusions and provide the rationale for conclusions.
- Prepare a ranking of high vulnerability areas (if applicable) to provide a basis for prioritization of workplan activities.
- The updated GAR shall utilize GIS mapping applications, graphics, and tables, as appropriate, to clearly convey pertinent data, support data analysis, and show results.

4. *Groundwater vulnerability designations.* The GAR Update/Addenda shall review and confirm or modify groundwater vulnerability designations in consideration of high and low vulnerability definitions provided in Attachment E of the Order. Vulnerability designations may be refined/ updated periodically during the Monitoring Report process. The vulnerability designations will be made by CRC using a combination of physical properties (soil type, depth to groundwater, known agricultural impacts to beneficial uses, etc.) and management practices. The CRC shall provide the rationale for proposed vulnerability determinations. The Executive Officer will make the final determination regarding vulnerability designations.

5. *Prioritization of high vulnerability groundwater areas.* If high vulnerability areas are identified during the GAR update analysis, the CRC may prioritize the areas designated as high vulnerability areas to comply with the requirements of this Order, including conducting monitoring programs and carrying out required studies,. When establishing relative priorities for high vulnerability areas, the CRC may consider, but not be limited to, the following:

- Identified exceedances of water quality objectives for which different types of rice operation waste discharges are the cause, or a contributing source.
- The proximity of the high vulnerability area to areas contributing recharge to urban and rural communities where groundwater serves as a significant source of supply.
- Existing field or operational practices identified to be associated with rice operation waste discharges that are the cause, or a contributing source.
- Legacy or ambient conditions of the groundwater.
- Groundwater basins currently or proposed to be under review by CV-SALTS.
- Identified constituents of concern, e.g., relative toxicity, mobility.

Additional information such as models, studies, and information collected as part of this Order may also be considered in designating and prioritizing vulnerability areas for groundwater. Such data includes, but is not limited to, 1) those areas that have been identified by the State Water Board as Hydrogeologically Vulnerable Areas, 2) California Department of Pesticide Regulation groundwater protection areas, and 3) areas with exceedances of water quality objectives for which waste discharges from rice operations may cause or contribute to the exceedance.

The Executive Officer will review and may approve or require changes to any CRC proposed high/low vulnerability areas and the proposed priority ranking. The vulnerability areas, or any changes thereto, shall not be effective until CRC receipt of written approval by the Executive Officer.

B. Groundwater Quality Trend Monitoring

This section provides the objectives and minimum sampling and reporting requirements for Groundwater Quality Trend Monitoring. As specified in Section IV.C of this MRP, the CRC is required to develop a workplan that will describe the methods that will be utilized to achieve the trend monitoring requirements.

1. *Objectives.* The objectives of Groundwater Quality Trend Monitoring are (1) to determine current water quality conditions of groundwater relevant to rice operations, and (2) to develop long-term groundwater quality information that can be used to evaluate the regional effects (i.e., not site-specific effects) of rice operations and its practices.
2. *Implementation.* To reach the stated objectives for the Groundwater Quality Trend Monitoring program, the CRC has proposed a groundwater monitoring network (Table 5) that will be monitored for rice lands in the Sacramento Valley. These existing shallow wells are specifically designed to yield data which can be compared with historical and future data to evaluate long-term groundwater trends.

The CRC shall submit a proposed Trend Groundwater Monitoring Workplan described in Section IV.C below to the Central Valley Water Board. The rationale for the distribution of trend monitoring wells shall be included in the workplan.

3. *Reporting.* The results of trend monitoring are to be included in the CRC's Monitoring Report and shall include a map of the sampled wells, tabulation of the analytical data, and time concentration charts. Groundwater monitoring data are to be submitted electronically to the Central Valley Water Board in a format specified by the Executive Officer.

Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the CRC) from each well, the CRC is to evaluate the data for trends. The methods to be used to evaluate trends shall be proposed by the CRC in the Trend Groundwater Monitoring Workplan described in Section IV.C below.

C. Trend Monitoring Workplan

The CRC shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in Section IV.B of this MRP. The workplan shall be submitted to the Executive Officer for review and approval.

The workplan shall use the existing United States Geological Survey (USGS) shallow rice wells as trend groundwater monitoring wells.^{10,11} Table 5 shows the list of monitoring wells for the groundwater trend monitoring.

All operational USGS shallow rice wells identified in Table 5 shall be monitored for all constituents listed in Table 6 for the first year. Subsequently, monitoring shall occur on a rotating basis, with half of the existing monitoring wells monitored the second year and the remaining half the third year. This rotation of monitoring wells shall continue unless modified by the Executive Officer. After the third year of monitoring, the CRC may request a reduction in groundwater monitoring to for approval by the Executive Officer.

¹⁰ Milby Dawson, B,J, 2001. *Shallow Ground-Water Quality Beneath Rice Areas in the Sacramento Valley, California, 1997*. USGS Water-Sources Investigations Report 01-4000, National Water-Quality Assessment Program, Water-Resources Investigations Report, 04-4000.

¹¹ If access to any of the USGS wells is not provided, the CRC must propose and provide a technical justification for an alternative trend monitoring site.

The Trend Monitoring Workplan shall provide information/details regarding the following topics:

1. *Workplan approach.* The workplan shall include a discussion of the wells to be monitored during each rotation year. The workplan shall outline the schedule for the monitoring period for the first and subsequent years, as well as any proposed changes to Table 5 regarding the wells to be monitored and their locations.
2. *Well details.* Details for wells identified in Table 5 for trend monitoring, including:
 - i. GPS coordinates;
 - ii. Physical address of the property on which the well is situated (if available);
 - iii. California State well number (if known);
 - iv. Well depth;
 - v. Top and bottom perforation depths;
 - vi. A copy of the water well drillers log, if available;
 - vii. Depth of standing water (static water level), if available (this may be obtained after implementing the program); and
 - viii. Well seal information (type of material, length of seal).
3. *Proposed sampling schedule.* The proposed sampling schedule shall describe which trend monitoring wells will be sampled and the month(s) of sampling. At a minimum, the schedule must propose annual sampling at the same time of the year for the indicator parameters identified in Table 6 below.
4. *Workplan implementation and analysis.* The proposed method(s) to be used to evaluate trends in the groundwater monitoring data over time.

The Trend Monitoring Workplan must include a proposed timeframe for establishing a trend monitoring site (or sites) in any areas identified in the Groundwater Quality Assessment Report as having data gaps.

As part of the Groundwater Quality Trend Monitoring Workplan, the CRC shall include a plan to address the Yuba County and fringe areas data gaps and include the proposed elements to resolve the data gaps, as identified in their GAR, in Section 7.2.3.

Table 5. Shallow Groundwater Monitoring Network for Rice Lands

USGS Report Well ID ^a	DWR Well ID	Latitude	Longitude	Well depth (fbfs)	Screened interval (fblls)	Sub-basin
2	012N003E18H001M	38.886917 N	121.672744 W	49.9	40.0-44.9	Sutter
3	012N002E09B002M	38.908489 N	121.755067 W	28.9	19.0-24.0	Sutter
6	014N002E10R001M	39.070953 N	121.727539 W	44.0	34.1-39.0	Sutter
8	015N002W16R001M	39.148347 N	122.079272 W	35.1	24.9-29.9	Colusa
9	015N002W03E001M	39.183167 N	122.078083 W	35.1	24.9-29.9	Colusa
10	017N003W35M001M	39.281794 N	122.171897 W	35.1	24.9-29.9	Colusa
11	017N002W14G001M	39.329000 N	122.162997 W	33.1	24.9-29.9	Colusa
12	018N001W27B001M	39.390972 N	121.955308 W	33.5	23.6-28.5	West Butte
15	018N002E09L001M	39.426500 N	121.761656 W	35.1	24.9-29.9	East Butte
16	018N002W12G002M	39.429003 N	122.032369 W	35.1	24.9-29.9	Colusa
17	018N001E08D001M	39.434842 N	121.888378 W	38.4	28.5-33.5	West Butte
18	019N003W25R001M	39.470797 N	122.136864 W	38.4	28.5-33.5	Colusa
19	019N003W25E001M	39.472989 N	122.164283 W	35.1	24.9-29.9	Colusa
20	019N001E20R001M	39.479850 N	121.878736 W	48.6	33.5-43.6	West Butte
21	019N001E22B001M	39.490261 N	121.847603 W	35.1	24.9-29.9	East Butte
22	019N002W23E001M	39.491650 N	122.055839 W	35.4	25.6-30.5	Colusa
24	020N002E35J002M	39.541653 N	121.707744 W	35.1	24.9-29.9	East Butte
25	020N002W32J001M	39.542922 N	122.099117 W	35.1	24.9-29.9	Colusa
26	020N002W25A001M	39.564586 N	122.027594 W	35.1	24.9-29.9	Colusa
28	020N002E08A001M	39.608131 N	121.815794 W	35.1	24.9-29.9	East Butte

^a As identified in Milby Dawson, B,J, 2001. *Shallow Ground-Water Quality Beneath Rice Areas in the Sacramento Valley, California, 1997*. USGS Water-Sources Investigations Report 01-4000, National Water-Quality Assessment Program, Water-Resources Investigations Report, 04-4000.

Table 6. Monitored Parameters at Groundwater Trend Monitoring Wells

	Measured Parameter
Annual Monitoring	
	Conductivity (at 25 °C)* (µmhos/cm) Total dissolved solids (TDS) (mg/L) pH* (pH units) Dissolved oxygen (DO)* (mg/L) Temperature* (°C) Nitrate + nitrite as nitrogen (mg/L) Total ammonia as nitrogen (mg/L)
Sampled initially and once every five years thereafter	
	General minerals (mg/L): <ul style="list-style-type: none"> • Anions (carbonate, bicarbonate, chloride, and sulfate) • Cations (boron, calcium, sodium, magnesium, and potassium)

* Field parameters

D. Management Practices Evaluation Program

The purpose of the Management Practices Evaluation Program (MPEP) is to determine the effects, if any, rice operations may have on groundwater quality where rice lands fall under a Groundwater Quality Management Plan (GQMP). Should a Management Practice Evaluation Program be required, this section provides the goals, objectives, and minimum reporting requirements for the MPEP, or equivalent approach described in the GQMP that addresses the requirements of this section. As specified in section IV.E of this MRP, the CRC is required to develop a workplan that will describe the methods that will be utilized to achieve the MPEP requirements.

1. *Objectives.* The objectives of the MPEP are to:
 - Identify whether existing site-specific management practices are protective of groundwater quality within high vulnerability groundwater areas,
 - Determine if newly implemented management practices are improving or may result in improving groundwater quality.
 - Develop an estimate of the effect of Growers' discharges of constituents of concern on groundwater quality in high vulnerability areas.
 - Utilize the results of evaluated management practices to determine whether practices implemented at represented Growers' farms (i.e., those not specifically evaluated, but having similar site conditions), need to be improved.
2. *Implementation.* Since management practices evaluation may transcend watershed or CRC boundaries, this Order allows developing a MPEP on a watershed or regional basis that involves participants in other areas or third-party groups, provided the evaluation studies are conducted in a manner representative of areas to which it will be applied.

A master schedule describing the rank or priority for the investigation(s) of the high vulnerability areas to be examined under the MPEP shall be prepared and submitted to the Executive Officer as detailed in the Management Practices Evaluation Program Workplan Section IV.E.

3. *Report.* Reports of the MPEP must be submitted to the Executive Officer as part of the CRC's Monitoring Report or in a separate report due on the same date as the Monitoring Report. The report shall include all data¹² (including analytical reports) collected by each phase of the MPEP since the previous report was submitted. The report shall also contain a tabulated summary of data collected to date by the MPEP. The report shall summarize the activities conducted under the MPEP, and identify the number and location of installed monitoring wells relative to each other and other types of monitoring devices. Within each report, the CRC shall evaluate the data and make a determination whether groundwater is being impacted by activities at farms being monitored by the MPEP.

Each report shall also include an evaluation of whether the specific phase(s) of the Management Practices Evaluation Program is/are on schedule to provide the data needed to complete the Management Practices Evaluation Report (detailed below) by the required deadline. If the evaluation concludes that information needed to complete the Management Practices Evaluation Report may not be available by the required deadline, the report shall include measures that will be taken to bring the program back on schedule.

4. *Management Practices Evaluation Report.* No later than six (6) years after implementation of each phase of the MPEP, the CRC shall submit a Management Practices Evaluation Report (MPER) identifying management practices that are protective of groundwater quality for the range of conditions found at farms covered by that phase of the study. The identification of management practices for the range of conditions must be of sufficient specificity to allow Growers and staff of the Central Valley Water Board to identify which practices at monitored

¹² The data need not be associated with a specific parcel or Grower.

farms are appropriate for farms with the same or similar range of site conditions, and generally where such farms may be located within the area covered by this Order (e.g., the summary report may need to include maps that identify the types of management practices that should be implemented in certain areas based on specified site conditions). The MPER must include an adequate technical justification for the conclusions that incorporates available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality.

The report shall include an assessment of each management practice to determine which management practices are protective of groundwater quality. If monitoring concludes that management practices currently in use are not protective of groundwater quality based upon information contained in the MPER, and therefore are not confirmed to be sufficient to ensure compliance with the groundwater receiving water limitations of the Order, the CRC in conjunction with other experts (e.g., University of California Cooperative Extension, Natural Resources Conservation Service) shall propose and implement new/alternative management practices to be subsequently evaluated. Where applicable, existing GQMPs shall be updated by the CRC to be consistent with the findings of the Management Practices Evaluation Report.

E. Management Practices Evaluation Workplan

Should a Management Practices Evaluation Program be required, the CRC shall prepare a Management Practices Evaluation Workplan as specified in section VIII.C.2 of the Order. The Management Practices Evaluation Workplan may be included in the applicable Groundwater Quality Management Plan. The workplan shall be submitted to the Executive Officer for review and approval. The workplan must identify a reasonable number of locations situated throughout the high vulnerability groundwater area(s), and encompassing the range of management practices used and site conditions under which rice is grown. The workplan shall be designed to meet the objectives and minimum requirements described in Section IV.D of this MRP.

1. *Workplan approach.* The workplan must include a scientifically sound approach to evaluating the effect of management practices on groundwater quality. The workplan must include a mass balance and conceptual model of the transport, storage, and degradation/chemical transformation mechanisms for the constituents of concern, or equivalent method approved by the Executive Officer¹³. The proposed approach may include:
 - groundwater monitoring,
 - root zone studies,
 - modeling,
 - vadose zone sampling, or
 - other scientifically sound and technically justifiable methods for meeting the objectives of the Management Practices Evaluation Program.

Sufficient groundwater monitoring data should be collected or available to confirm or validate the conclusions regarding the effect of the evaluated practices on groundwater quality. Any groundwater quality monitoring that is part of the workplan must be of first encountered groundwater. Monitoring of first encountered groundwater more readily allows identification of the area from which water entering a well originates than deeper wells and allows identification of changes in groundwater quality from activities on the surface at the earliest possible time.

2. *Groundwater quality monitoring –constituent selection.* Where groundwater quality monitoring is proposed, the Management Practices Evaluation Workplan must identify:
 - the constituents to be assessed,

¹³ For nitrate, the proposed equivalent method may be based on recommendations developed by the California Department of Food and Agriculture's Nitrogen Task Force or the State Water Resource Control Board's Expert Panel on nitrates.

- the frequency of the data collection (e.g., groundwater quality or vadose zone monitoring; soil sampling) for each constituent, and
- sampling techniques/methodology.

The proposed constituents shall be selected based upon the information collected from the GAR and must be sufficient to determine if the management practices being evaluated are protective of groundwater quality. At a minimum, the baseline constituents for any groundwater quality monitoring must include those parameters required under trend monitoring.

3. *Workplan implementation and analysis.* The proposed Management Practices Evaluation Workplan shall contain sufficient information/justification for the Executive Officer to evaluate the ability of the evaluation program to identify whether existing management practices in combination with site conditions, are protective of groundwater quality. The workplan must explain how data collected at evaluated farms will be used to assess potential impacts to groundwater at represented farms that are not part of the Management Practices Evaluation Program's network. This information is needed to demonstrate whether data collected will allow identification of management practices that are protective of water quality at Grower farms, including represented farms (i.e., farms for which on-site evaluation of practices is not conducted).
4. *Master workplan –prioritization.* If the CRC chooses to rank or prioritize any high vulnerability areas identified in its updated GAR, a single Management Practices Evaluation Workplan may be prepared which includes a timeline describing the priority and schedule for each of the areas to be investigated and the submittal dates for addendums proposing the details of each area's investigation.
5. *Installation of monitoring wells.* Upon approval of the Management Practices Evaluation Program Workplan, the CRC shall prepare and submit a Monitoring Well Installation and Sampling Plan (MWISP), if applicable. A description of the MWISP and its required elements/submittals are presented as Appendix MRP-2. The MWISP must be approved by the Executive Officer prior to the installation of the MWISP's associated monitoring wells.

V. Reporting Requirements

A. Annual Monitoring Report

The annual monitoring report (AMR) shall be submitted by **31 December** of every year, covering any monitoring conducted from 1 November of the previous year through 31 October of the current year. The monitoring report shall include the following components:

1. Signed Transmittal Letter;
2. Title page;
3. Table of contents;
4. Executive Summary;
5. Description of the CRC geographical area;
6. Monitoring objectives and design;
7. Sampling site/monitoring well descriptions and rainfall records for the time period covered under the Annual Monitoring Report (AMR);
8. Location map(s) of sampling sites/monitoring wells, crops and land uses;
9. Summary of pesticides used on rice, including pounds of active ingredient applied and acreage, as well as any changes in label requirements,
10. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible,
11. Discussion of data relative to water quality objectives/trigger limits, and water quality management plan milestones, where applicable;
12. Proposed pesticide monitoring (see Section III.C.1);
13. Electronic data submittal;

14. Electronic groundwater data provided as specified by the Executive Officer;
15. Sampling and analytical methods used;
16. Summary of Quality Assurance Evaluation results (as identified in the most recent version of the CRC's approved QAPP for Precision, Accuracy and Completeness) ;
17. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
18. Required every three years, an evaluation of monitoring data to identify spatial trends and patterns;
19. Electronic or hard copies of photos obtained from all monitoring sites, clearly labeled with site ID and date.
20. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and related pesticide use information;
21. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
22. Status update on preparation and implementation of all Management Plans and other special projects;
23. Summary of Management Practice Information collected as part of Farm Evaluations;
24. Summary or updates of mitigation monitoring;
25. Summary of education and outreach activities;
26. Summary of nitrogen management plan reporting , if applicable, and
27. Conclusions and recommendations.

Additional requirements and explanations for the above annual report components are described below:

Report Component (1) -- Signed Transmittal Letter

A transmittal letter shall accompany each report. The transmittal letter shall be signed per the requirements given in Section IX of Order No. R5-2014-0032.

Report Component (8) -- Location Maps

Location map(s) showing the sampling sites, crops, and land uses within the CRC's geographic area must be updated yearly and included in each annual report. An accompanying list or table of monitoring site information must include the CEDEN comparable site code and name and Global Positioning System (GPS) coordinates. The map(s) must contain a level of detail that ensures they are informative and useful. GPS coordinates must be provided as latitude and longitude in the decimal degree coordinate system (to a minimum of five decimal places). The datum must be either WGS 1984 or NAD83, and clearly identified on the map. The source and date of all data layers must be identified on the map(s).

To aid the Central Valley Water Board in determining participants, the CRC shall submit GIS information (e.g., a shapefile) identifying parcels covered by the CRC. The data upon which the GIS information is based must be no greater than one (1) year old. This information shall be updated at least every three years, or whenever rice acreage varies by 20% from the latest submitted GIS information.

Report Component (10) -- Tabulated results

Data shall be reported in tabular form so that the required information is readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with the conditions of this MRP order.

Report Component (11) -- Data Discussion to Illustrate Compliance

For surface water data, electronic submittal of the field and laboratory data in a SWAMP comparable format must be included with the AMR. For groundwater data, monitoring results must be provided electronically as specified by the Executive Officer. Exceptions to the due date for submittal of electronic data may be granted by the Executive Officer if sufficient rationale exists.

Report Component (13) – Electronic Submittal of Monitoring Data

The Surface Water Monitoring Data Report shall include the following for the required reporting period:

1. An Excel workbook containing an export of all data records uploaded and/or entered into the CEDEN comparable database (surface water data). The workbook shall contain, at a minimum, those items detailed in the QAPP Guidelines.
2. The most current version of the CRC's eQAPP.
3. Electronic copies of all field sheets.
4. Electronic copies of photos obtained from all surface water monitoring sites, clearly labeled with the CEDEN comparable station code and date.
5. Electronic copies of all applicable laboratory analytical reports on a CD.
6. For toxicity reports, all laboratory raw data must be included in the analytical report (including data for failed tests), as well as copies of all original bench sheets showing the results of individual replicates, such that all calculations and statistics can be reconstructed. The toxicity analyses data submittals must include individual sample results, negative control summary results, and replicate results. The minimum in-test water quality measurements reported must include the minimum and maximum measured values for specific conductivity, pH, ammonia, temperature, and dissolved oxygen.
7. For chemistry data, analytical reports must include, at a minimum, the following:
 - a. A lab narrative describing QC failures,
 - b. Analytical problems and anomalous occurrences,
 - c. Chain of custody (COCs) and sample receipt documentation,
 - d. All sample results for contract and subcontract laboratories with units, RLs and MDLs,
 - e. Sample preparation, extraction and analysis dates, and
 - f. Results for all QC samples including all field and laboratory blanks, lab control spikes, matrix spikes, field and laboratory duplicates, and surrogate recoveries

Laboratory raw data such as chromatograms, spectra, summaries of initial and continuing calibrations, sample injection or sequence logs, prep sheets, etc., are not required for submittal, but must be retained by the laboratory in accordance with the requirements of Section X of the Order, Record-keeping Requirements.

If any data are missing from the AMR, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board. If data are not loaded into the CEDEN comparable database, this shall also be noted with the submittal.

Report Component (14) – Annual Groundwater Monitoring Results

The CRC shall submit the prior year's groundwater monitoring results as an Excel workbook containing an export of all data records in a format specified by the Executive Officer. If any data are missing from the report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board.

Report Component (16) -- Quality Assurance Evaluation (Precision, Accuracy and Completeness)

A summary of precision and accuracy results (both laboratory and field) is required in the annual monitoring report. The data quality indicators for precision and accuracy are listed in the QAPP with acceptance criteria. The CRC must review all QA/QC results to verify that protocols were followed and identify any results that did not meet acceptance criteria. A summary table or narrative description of all QA/QC results that did not meet objectives must be included in the annual report. The AMR must also include a discussion of how the failed QA/QC results affect the validity of the reported data and the corrective actions initiated.

In addition to precision and accuracy, the CRC must also calculate and report on completeness that includes the percentage of all quality control results that met acceptance criteria, as well as a determination of project completeness.

Report Component (18) -- Evaluation of Monitoring Data

Starting with the 2018 AMR and every three years thereafter, the CRC shall evaluate its monitoring data in the previous years in order to identify potential trends and patterns in surface and groundwater quality that may be associated with waste discharge from irrigated lands. The CRC must specifically determine whether there are any trends in degradation that may threaten applicable beneficial uses. As part of this evaluation, the CRC shall analyze all readily available monitoring data that meet program quality assurance requirements to determine deficiencies in monitoring for discharges from rice lands and whether additional sampling locations or sampling events are needed or if additional constituents should be monitored. If deficiencies are identified, the CRC must propose a schedule for additional monitoring or source studies.

Wherever possible, the CRC should utilize tables or graphs that illustrate and summarize the data evaluation.

Report Components (20/21) -- Summary of Exceedance Reports

A summary of the exceedances of water quality objectives or triggers that have occurred during the monitoring period is required in the AMR. In the event of exceedances for pesticides or toxicity, an evaluation of pesticide use data related to or potentially related to the exceedances must be included in the annual monitoring report.

Report Component (23) -- Summary of Management Practice Information

The CRC will aggregate and summarize information collected from Farm Evaluations once every three years beginning with the 2015 AMR. The summary of management practice data must include a quality assessment of the collected information by township (e.g. missing data, potentially incorrect/inaccurate reporting), and a description of corrective actions to be taken, if necessary. In addition to summarizing and aggregating the information collected, the CRC will provide the individual data records used to develop this summary in an electronic format, compatible with ArcGIS, identified to at least the Township (TRS) level.¹⁴

Report Component (24) -- Mitigation Monitoring

As part of the Monitoring Report, the CRC shall report on the CEQA mitigation measures reported by rice growers to meet the provisions of the Order and any mitigation measures the CRC has implemented on behalf of its growers. The CRC is not responsible for submitting information that Growers do not send them directly by the 1 October deadline (see Section VII.D of the Order for Grower mitigation monitoring requirements). The Mitigation Monitoring Report shall include information on the implementation of CEQA mitigation measures (mitigation measures are described in Attachment C of the Order), including the measure implemented, identified potential impact the measure addressed, location of the mitigation measure (township, range, section), and any steps taken to monitor the ongoing success of the measure.

B. Surface Water Exceedance Reports

The CRC shall provide surface water exceedance reports if monitoring results show exceedances of adopted numeric water quality objectives or trigger limits, which are based on interpretations of narrative water quality objectives. For each surface water quality objective exceeded at a monitoring location, the CRC shall submit an Exceedance Report to the Central Valley Water Board. The estimated flow at the monitoring location and photographs of the site must be submitted in addition to the exceedance report but do not need to be submitted more than once. The CRC shall evaluate all of its monitoring data and determine exceedances no later than five (5) business days after receiving the laboratory analytical reports for an event. Upon determining an exceedance, the CRC shall send the

¹⁴ The Grower and their associated parcel need not be identified.

Exceedance Report by email to the CRC's designated Central Valley Water Board staff contact by the next business day. The Exceedance Report shall describe the exceedance, the follow-up monitoring, and analysis or other actions the CRC may take to address the exceedance. Upon request, the CRC shall also notify the agricultural commissioner of the county in which the exceedance occurred and/or the director of the Department of Pesticide Regulation.

Surface water exceedances of pesticides or toxicity: When any pesticide or toxicity exceedance is identified at a location that is not under an approved management plan for toxicity or pesticides, follow-up actions must include an investigation of pesticide use within the watershed area that is physically associated with the exceedance location. This includes all rice pesticides applied within the area that drains to the monitoring site during the four weeks immediately prior to the exceedance date. The pesticide use information may be acquired from the agricultural commissioner, or from information received from agriculture practitioners or Growers within the same drainage area. Results of the pesticide use investigation must be summarized and discussed in the annual monitoring report.

C. Rice Pesticide Evaluation

In its first AMR following adoption of this Order and every five (5) years thereafter, the CRC shall submit in its AMR an updated evaluation of rice pesticides relative to potential effects on surface water quality. The evaluation shall consider the following factors based on their applicability and whether information is readily available: use information (e.g., pounds applied, acres treated, timing of application, product formulation, method of application, application rate, hold times, requirements associated with drift or discharge to surface waters), physical and chemical properties of the pesticide (e.g., degradation rate, adsorption coefficients) and the pesticide's toxicity to aquatic life and risk to human health (e.g., through review of relevant toxicity studies, benchmarks or criteria established for human health or aquatic life protection), and newly registered or cancelled pesticides that are registered for use on rice fields. As described in Section III.C.1, the Rice Pesticide Evaluation will be reviewed as part of a rice-specific process by Water Board staff that includes input from qualified scientists and coordination with the Department of Pesticide Regulation.

VI. Templates

The Order provides that the CRC may develop rice specific templates with approval by the Central Valley Water Board Executive Officer. This section describes the minimum requirements that must be met before approval of those templates.

Before Executive Officer approval of any template, the Central Valley Water Board will post the draft template on its website for a review and comment period. Stakeholder comments will be considered by Central Valley Water Board staff. Based on information provided by the CRC and after consideration of comments provided by other interested stakeholders, the Central Valley Water Board's Executive Officer will either: (1) approve the template; (2) conditionally approve the template or (3) disapprove the template. Review of the template and the associated action by the Executive Officer will be based on findings as to whether the template meets applicable requirements and contains all of the information required.

A. Farm Evaluation Template

The CRC is to develop a form or web-based information system to gather farm evaluation information from rice landowners. At a minimum, the following information should be in the Farm Evaluation Report:

- Identification of the acreage of rice grown and whether other crops are grown in rotation with rice.
- Location of the farm.
- Identification of on-farm management practices implemented to achieve the Order's farm management performance standards. Specifically track which management practices recommended in management plans have been implemented at the farm.

- Identification of whether or not water leaves the property, and where water leaves the property as well as identifying drainage ditches where water is discharged.
- Location of in-service wells and abandoned wells (well location information may be provided in a Farm Map that remains on-site and is made available for Central Valley Water Board inspection). Identification of whether wellhead protection and backflow prevention practices have been implemented.
- Acknowledgement by the Grower, if a rice producer but not landowner of the rice land enrolled under this Order, that the landowner has been notified of the provisions in the Order and joint responsibility for complying with the terms and conditions of the Order.

B. Nitrogen Management Plan Template

The Nitrogen Management Plan template must be developed by the CRC in consultation with the Central Valley Water Board, and as appropriate, the California Department of Food and Agriculture (CDFA), the University of California Extension, and the UNANR Publication, Rice Nutrient Management in California. In developing the template, the CRC should consider soil and plant tissue testing, nitrogen application rates, nitrogen application timing, consideration of organic nitrogen fertilizer, consideration of irrigation water nitrogen levels.

In addition to the Nitrogen Management Plan Template, the CRC must provide a template for the Nitrogen Management Plan Summary Report, if any high vulnerability areas associated with rice operations are identified and the constituent of concern is nitrate. The Nitrogen Management Plan Summary Report Template must provide for reporting of the nitrogen consumption ratio for each parcel enrolled by the Grower (this MRP requires reporting of this information to the board by township, Grower/parcel need not be specified). The Nitrogen Management Plan Summary Report must also gather information required in the Annual Monitoring Report and information needed for the GQMP, if applicable.

VII. Water Quality Triggers for Development of Management Plans

This Order requires that Growers comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan) contains numeric and narrative water quality objectives applicable to surface water and groundwater within the Order's watershed area. USEPA's 1993 National Toxics Rule (NTR) and 2000 California Toxics Rule (CTR) contain water quality criteria which, when combined with Basin Plan beneficial use designations constitute numeric water quality standards. Table 7 of this MRP lists Basin Plan numeric water quality objectives and NTR/CTR criteria for constituents of concern that may be discharged by Growers.¹⁵

Table 7 does not include water quality criteria that may be used to interpret narrative water quality objectives, which shall be considered trigger limits. Trigger limits for pesticides will be developed by the Central Valley Water Board staff through a process involving coordination with the Department of Pesticide Regulation (for pesticides) and stakeholder input. The trigger limits will be designed to implement narrative Basin Plan objectives and to protect applicable beneficial uses. The Executive Officer will make a final determination as to the appropriate trigger limits.

VIII. Quality Assurance Program Plan

The CRC must develop and/or maintain a QAPP that includes watershed and site-specific information, project organization and responsibilities, and the quality assurance components in the QAPP Guidelines. Chemical, bacteriological, and bioassay analyses shall be conducted at a

¹⁵ Future actions, including but not limited to, establishing or changing maximum contaminant levels, water quality objectives, or applicable implementation provisions could result in changes to, additions to, or the applicability of the numerical water quality objectives identified in Table 7.

laboratory certified for such analyses by the California Department of Public Health (DPH), except where the DPH has not developed a certification program for the material to be analyzed.

The CRC's existing QAPP was submitted to the Executive Officer on 29 April 2010 and approved by the Central Valley Water Board Quality Assurance Officer on 19 April 2011. The existing QAPP is acceptable for use by the CRC. Any necessary modifications to the QAPP for groundwater monitoring shall be submitted with the groundwater trend monitoring workplan. Any proposed modifications to the approved QAPP must receive Executive Officer approval before implementation.

The Central Valley Water Board may conduct an audit of the CRC's contracted laboratories at any time to evaluate compliance with the most current version of the QAPP Guidelines. Quality control requirements are applicable to all of the constituents listed in QAPP Guidelines, as well as any additional constituents that are analyzed or measured, as described in the appropriate method. Acceptable methods for laboratory and field procedures as well as quantification limits are described in the QAPP Guidelines.

This MRP Order becomes effective XX [Month] 2014 and remains in effect unless rescinded or revised by the Central Valley Water Board or the Executive Officer.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 27 March 2014.

Original signed by
Pamela C. Creedon

PAMELA C. CREEDON, Executive Officer

Table 7. Basin Plan Numeric Water Quality Objectives for the Sacramento River Watershed.

Constituent / Parameter (Synonym)	Basin Plan Water Quality Objectives	Source of Numeric Threshold <i>(footnotes in parentheses are at bottom of table)</i>	Numeric Threshold(a)	Units	G=Groundwater IS=Inland SW	Numeric Threshold Protects Designated Beneficial Use(s) in the Water Body:							CAS Number
						Groundwater			Inland Surface Waters				
						MUN- MCL	MUN- Toxicity	AGR	MUN- MCL	MUN- Toxicity	Aquatic Life & Consump	AGR	
Coliform, fecal	Bacteria	Basin Plan (b) (c)	200/100	MPN/mL	IS								--
		Basin Plan (b) (d)	400/100	MPN/mL	IS								
Coliform, total	Bacteria	Basin Plan	2.2/100	MPN/mL	G	X							--
Conductivity at 25°C (Electrical conductivity)	Salinity	Basin Plan, Sacramento River at Knights Landing above Colusa Basin Drain (e)	230	µmhos/cm	IS	X							
		Basin Plan, Sacramento River at Knights Landing above Colusa Basin Drain (f)	235	µmhos/cm	IS								
		Basin Plan, Sacramento River at I Street Bridge (g)	240	µmhos/cm	IS								
		Basin Plan, Sacramento River at I Street Bridge (h)	340	µmhos/cm	IS								
		Basin Plan, North Fork of the Feather river, Middle Fork of the Feather River from Little Last Chance Creek to Lake Oroville, Feather River from the Fish Barrier Dam at Oroville to Sacramento River (i)	150	µmhos/cm	IS								
		California Secondary MCL	900-1600	µmhos/cm	G & IS	X			X				
Copper	Chemical Constituents	California Secondary MCL (total copper)	1,000	µg/L	G & IS	X			X	X			7440-50-8
	Toxicity	California Toxics Rule (USEPA), (j) (dissolved copper)	variable	µg/L	IS								
Dissolved Oxygen, minimum	Dissolved Oxygen	Basin Plan, waters designated WARM	5.0	mg/L	IS						X		
		Basin Plan, waters designated COLD and/or SPWN	7.0	mg/L	IS						X		
		Basin Plan, Sacramento River from Keswick Dam to Hamilton City (1 June to 31 August)	9.0	mg/L	IS						X		
		Basin Plan, Feather River from Fish Barrier Dam at Oroville to Honcut Creek (1 September to 31 May)	8.0	mg/L	IS						X		
Mercury	Chemical Constituents	California Primary MCL	2	µg/L	G & IS	X							
	Toxicity	California Toxics Rule (USEPA) for sources of drinking water	0.05	µg/L	IS				X	X			
		California Toxics Rule (USEPA) for other waters	0.051	µg/L	IS & E						X		X
Nitrate (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L	G & IS	X	X		X	X			14797-55-8
Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	1	mg/L	G & IS	X	X		X	X			14797-65-0
Nitrate +Nitrite (as nitrogen)	Chemical Constituents	California Primary MCL	10	mg/L									

Table 7. Basin Plan Numeric Water Quality Objectives for the Sacramento River Watershed (continued)

Constituent / Parameter (Synonym)	Basin Plan Water Quality Objectives	Source of Numeric Threshold <i>(footnotes in parentheses are at bottom of table)</i>	Numeric Threshold(a)	Units	G=Groundwater IS=Inland SW	Receiving Water Limitation Protects Designated Beneficial Use(s) in the Water Body:							
						Groundwater			Inland Surface Waters				CAS Number
						MUN- MCL	MUN- Toxicity	AGR	MUN- MCL	MUN- Toxicity	Aquatic Life & Consump	AGR	
pH – minimum	pH	Basin Plan	6.5	units	G & IS	X	X		X	X			
pH -- maximum			8.5	units	G & IS	X	X		X	X		X	
Temperature	Temperature	Basin Plan (k)	variable		IS								
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500 – 1,000	mg/L	G & IS	X	X		X	X			
Turbidity	Turbidity	Basin Plan, where natural turbidity is <1 NTU	2	NTU	IS								
		Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.	variable; 2-6	NTU	IS								
		Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.	variable; 6-70	NTU	IS								
		Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.	variable 60-110	NTU	IS								
		Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.	variable	NTU	IS								

Footnotes to Table 7

- a Numeric thresholds, as maximum levels unless noted otherwise.
- b Applies to water designated for contact recreation (REC-1)
- c Geometric mean of the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed this number.
- d No more than ten percent of the total number of samples taken during any 30-day period shall exceed this number
- e Based upon previous 10 years of record, this number shall not be exceeded (50 percentile).
- f Based upon previous 10 years of record, this number shall not be exceeded (90 percentile).
- g Based upon previous 10 years of record, this number shall not be exceeded (50 percentile).
- h Based upon previous 10 years of record, this number shall not be exceeded (90 percentile).
- i Shall not exceed this number (90 percentile) in well-mixed waters of the Feather River
- j These numeric thresholds are hardness dependent. As hardness increases, water quality objectives generally increase.
- k The natural receiving water temperature shall not be altered unless it can be demonstrated to the satisfaction of the Water Board that such alteration does not adversely affect beneficial uses. However, at no time shall the temperature of WARM and COLD waters be increased more than 5 degrees F above natural receiving water temperature

Abbreviations

CAS Chemical Abstracts Service Registry Number
 MCL maximum contaminant limit
 MUN municipal and domestic supply

Beneficial Uses

AGR – Agricultural water uses, including irrigation supply and stock watering
 Aquatic Life & Consump -- Aquatic life and consumption of aquatic resources
 MUN-MCL – Municipal or domestic supply well default selection of drinking water MCL when available
 MUN-Toxicity – Municipal or domestic supply well consideration of human toxicity thresholds that are more stringent than drinking water MCLs

Monitoring and Reporting Program R5-2014-0032

Appendix MRP-1

Management Plan Requirements

Surface Water and Groundwater

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MRP-1: Management Plan Requirements for Surface Water and Groundwater

I. Management Plan Development and Required Components

This appendix describes requirements for the development of water quality management plans under Waste Discharge Requirements General Order for rice growers¹ (Growers) in the Sacramento Valley Order R5-2013-XXXX (hereafter "Order"). When a management plan has been triggered, the California Rice Commission (CRC) shall ascertain whether rice discharges are known to cause or contribute to the "water quality problem" (as defined in Attachment E). If the potential source(s) of the water quality exceedance(s) is (are) unknown, the CRC may propose studies to be conducted to determine the cause, or to eliminate rice operations as a potential source (see Special Study Requirements in section I.D. below).

When a Surface Water or Groundwater Quality Management Plan (SQMP/GQMP) has been triggered, the management plan shall contain the required elements presented and discussed in the following sections. CRC may develop one SQMP or GQMP to cover all areas where plans have been triggered rather than developing separate management plans for each management area where plans have been triggered. The CRC would maintain the overarching plan as new information is collected, potentially triggering additional management areas and completion of other management areas.

If multiple constituents of concern (COCs) are to be included in a single management plan, a discussion of the prioritization process and proposed schedule shall be included in the plan. Prioritization schedules must be consistent with requirements described in section XII of the Order, Time Schedule for Compliance.

If a number of management plans are triggered, the CRC shall submit a SQMP/GQMP prioritization list to the Central Valley Water Board Executive Officer. This list may prioritize the order of SQMP/GQMP development based on, for example, 1) the potential to harm public health; 2) the beneficial use affected; and/or 3) the likelihood of meeting water quality objectives by implementing management practices. Prioritization schedules shall be consistent with requirements described in section XII of this Order, Time Schedule for Compliance. The Executive Officer may approve or require changes be made to the SQMP/GQMP priority list. The CRC shall implement the prioritization schedule approved by the Executive Officer.

Special studies may be proposed when a Management Plan is triggered. A special study may be part of the management plan strategy to identify rice contribution and/or management practice effectiveness. A special study may be used to determine whether rice operations are causing or contributing to the conditions that triggered the Management Plan requirement. These studies may be field or regional, but should be representative of rice field conditions and practices. Further information on special study requirements are in section I.D.

To the extent that required items have been addressed in previous CRC documents (such as the GAR), the relevant information can be included by reference.

A. Introduction and Background

The introduction portion of the management plan shall include a discussion of the constituents of concern (COCs) that are the subject of the plan and the water quality objective(s) or trigger(s) requiring preparation of the management plan. The introduction shall also include an identification

¹ Grower(s) is defined to mean a producer of rice as defined in California Food and Agriculture Code, section 71032, or a landowner of land that leases, rents, or otherwise owns land that is used by a producer of rice. For both producers of rice and landowners, the land in question must be located within the Sacramento Valley, which are in the counties of Sacramento, Sutter, Yuba, Butte, Glenn, Colusa, Yolo, Placer, and Tehama.

(both narrative and in map form) of the boundaries (geographic and surface water/groundwater basin[s] or portion of a basin) to be covered by the management plan including how the boundaries were delineated.

For groundwater, previous work conducted to identify the occurrence of the COCs (e.g., studies, monitoring conducted) should be summarized for the GQMP area.

B. Physical Setting and Information

1. General Requirements

The management plan needs to provide a discussion of the physical conditions that affect surface water (for a SQMP) or groundwater (for a GQMP) in the management plan area and the associated existing data. At a minimum, the discussion needs to include the following:

- a. Land use maps which identify the crops being grown in the SQMP watershed or GQMP area. Map(s) must be in electronic format using standard geographic information system software (ArcGIS shapefiles).
- b. Identification of the potential irrigated agricultural sources of the COC(s) for which the management plan is being developed. If the potential sources are not known, a study may be designed and implemented to determine the source(s) or to eliminate rice lands as a potential source. Requirements for source identification studies are given in section I.D below. In the alternative, instead of conducting a source identification study, the CRC may develop a management plan for the COC(s) that meets the management plan requirements as specified in this appendix.
- c. A list of the designated beneficial uses as identified in the applicable Basin Plan.
- d. A baseline inventory of identified existing management practices in use within the management plan area that could be affecting the concentrations of the COCs in surface water and/or groundwater (as applicable) and locations of the various practices.
- e. A summary, discussion, and compilation of available surface water and/or groundwater quality data (as applicable) for the parameters addressed by the management plan. Available data from existing water quality programs may be used, including but not limited to: Surface Water Ambient Monitoring Program (SWAMP), California State Water Resources Control Board (State Water Board) Groundwater Ambient Monitoring Assessment (GAMA) Program, United States Geological Survey (USGS), California Department of Public Health (DPH), California Department of Pesticide Regulation (DPR), California Department of Water Resources (DWR), and local groundwater management programs. The GAR developed for the CRC's geographic area, and groundwater quality data compiled in that document, may serve as a reference for these data.

2. Surface Water – Additional Requirements

The SQMP shall also include a description of the watershed areas and associated COC being addressed by the plan. For a water body that is representative of other water bodies, those areas being represented must also be identified in the SQMP.

3. Groundwater – Additional Requirements

The GQMP shall include:

- a. Soil types and other relevant soils data as described in the appropriate Natural Resources Conservation Service (NRCS) soil survey(s) or other applicable studies. The soil unit descriptions and a map of their areal extent within the study area must be included.
- b. A description of the geology and hydrogeology for the area covered by the GQMP. The description shall include:

- i. Regional and area specific geology, including stratigraphy and existing published geologic cross-sections.
 - ii. Groundwater basin(s) and sub-basins contained within the GQMP area, including a discussion of their general water chemistry as applicable to the constituent of concern and known from existing publications, including the GAR (e.g., range of electrical conductivity [conductivity at 25 C, EC], concentrations of major anions and cations, nutrients, total dissolved solids [TDS], pH, dissolved oxygen and hardness). The discussion should reference and provide figures of existing Piper (tri-linear) diagrams, Stiff diagrams and/or Durov Diagrams for the GQMP area (see definitions contained in Attachment E of the Order).
 - iii. Known water bearing zones, areas of shallow and/or perched groundwater, as well as areas of discharge and recharge to the basin/sub-basin in the GQMP area (rivers, unlined canals, lakes, and recharge or percolation basins).
 - iv. Identification of which water bearing zones within the GQMP area are being utilized for domestic, irrigation, and municipal water production.
 - v. Aquifer characteristics such as depth to groundwater, groundwater flow direction, hydraulic gradient, and hydraulic conductivity, as known or estimated based on existing information (see definitions contained in Attachment E of the Order).
- c. Identification, where possible, of irrigation water sources (surface water origin and/or groundwater) and their available general water chemistry (range of EC, concentrations of major anions and cations, nutrients, TDS, pH, dissolved oxygen and hardness).

C. Management Plan Strategy

This section provides a discussion of the strategy to be used in the implementation of the management plan and should at a minimum, include the following elements:

1. A description of the approach to be utilized by the management plan (e.g., multiple COC's addressed in a scheduled priority fashion, multiple areas covered by the plan with a single area chosen for initial study, or all areas addressed simultaneously [area wide]). Any prioritization included in the management plan must be consistent with the requirements in section XII of the Order, Time Schedule for Compliance.
2. The plan must include actions to meet the following goals and objectives:
 - a. Compliance with the Order's receiving water limitations (section III of the Order).
 - b. Educate Growers about the sources of the water quality exceedances in order to promote prevention, protection, and remediation efforts that can maintain and improve water quality.
 - c. Identify, validate, and implement management practices to reduce loading of COC's to surface water or groundwater, as applicable, thereby improving water quality.
3. Identify the duties and responsibilities of the individuals or groups implementing the management plan. This section should include:
 - a. Identification of key individuals involved in major aspects of the project (e.g., project lead, data manager, sample collection lead, lead for stakeholder involvement, quality assurance manager).
 - b. Discussion of each individual's responsibilities.
 - c. An organizational chart with identified lines of authority.
4. Strategies to implement the management plan tasks. This element must:
 - a. Identify the entities or agencies that will be contacted to obtain data and assistance.
 - b. Identify management practices used to control sources of COCs from irrigated lands that are

1) technically feasible; 2) economically feasible; 3) proven to be effective at protecting water quality, and 4) will comply with sections III.A and B of the Order. Practices that growers will implement must be discussed, along with an estimate of their effectiveness or any known limitations on the effectiveness of the chosen practice(s). Practices identified may include those that are required by local, state, or federal law. Where an identified constituent of concern is a pesticide that is subject to DPR's Groundwater Protection Program, the GQMP may refer to DPR's regulatory program for that pesticide and any requirements associated with the use of that pesticide provided that the requirement(s) are sufficient to meet water quality objectives.

- c. Identify outreach that will be used to disseminate information to participating growers. This discussion shall include: the strategy for informing growers of the water quality problems that need to be addressed, method for disseminating information on relevant management practices to be implemented, and a description of how the effectiveness of the outreach efforts will be evaluated. The CRC may conduct outreach efforts or work with the assistance of the County Agricultural Commissioners, U.C. Cooperative Extension, Natural Resources Conservation Service, Resource Conservation District, California Department of Food and Agriculture, or other appropriate groups or agencies.
- d. Include a specific schedule and milestones for the implementation of management practices and tasks outlined in the management plan. The schedule must include the following items: time estimated to identify new management practices as necessary to meet the Order's surface and groundwater receiving water limitations (section III of the Order) and a timetable for implementation of identified management practices (e.g., at least 25% of growers identified must implement management practices by year 1; at least 50% by year 2). The overall time schedule for compliance must be consistent with the requirements in section XII of the Order, Time Schedule for Compliance.
- e. Establish measureable performance goals that are aligned with the elements of the management plan strategy. Performance goals include specific targets that identify the expected progress towards meeting a desired outcome.

D. Special Study Requirements

In lieu of developing a Management Plan Strategy, the CRC may propose a special study when a management plan is triggered. The special study may replace site monitoring to answer specific questions, such as identifying if rice is causing or contributing to the conditions that triggered the requirement to develop a Management Plan, and/or the effectiveness of certain management practices. The proposal must include the following elements:

- Clear stated objectives and goals of the study, with information on the how the study will be representative of rice field operations.
- A description of the study, including any sampling or monitoring that will be required.
- An estimated schedule for the special study that will include milestones, such as completion of sampling, data evaluation, and reporting of results.
- If addressing a COC, evaluate the locations and management practices that can be implemented to address rice discharges of the COC.

Any request for a special study must be submitted to the Executive Officer for approval. If results of an approved study show that rice operations are not a source for the COC, then the CRC can request completion of the triggered management plan. If rice lands are identified as a source, a SQMP/GQMP strategy shall be prepared and implemented.

E. Monitoring Design

1. General Requirements

The monitoring system must be designed to measure effectiveness at achieving the goals and objectives of the SQMP or GQMP and capable of determining whether management practice changes made in response to the management plan are effective and can comply with the terms of the Order.

Management practice-specific or commodity-specific field studies may be used to approximate the contribution of irrigated lands operations. Where the CRC determines that field studies are appropriate or the Executive Officer requires a technical report under CWC 13267 for a field study, the CRC must identify a reasonable number and variety of field study sites that are representative of the particular management practice being evaluated.

2. Surface Water – Additional Requirements

The strategy to be used in the development and implementation of the monitoring methods for surface water must address the general requirements and, at a minimum, meet the following requirements:

- a. The location(s) of the monitoring site and schedule (including frequencies) for monitoring should be chosen to be representative of the COC discharge to the watershed.
- b. Surface water monitoring data must be submitted electronically per the requirements given in section III.D of the MRP.

3. Groundwater – Additional Requirements

The CRC's Management Practice Evaluation Plan and Groundwater Quality Trend Monitoring shall be evaluated to determine whether additional monitoring is needed in conjunction with the proposed management strategy(ies) to evaluate the effectiveness of the strategy(ies). Refer to section IV of the MRP for groundwater monitoring requirements.

F. Data Evaluation

Methods to be used to evaluate the data generated by SQMP/GQMP monitoring and to evaluate the effectiveness of the implemented management practices must be described. The discussion should include at a minimum, the following:

1. Methods to be utilized to perform data analysis (graphical, statistics, modeling, index computation, or some combination thereof).
2. Information necessary to assess program effectiveness going forward, including the tracking of management practice implementation. The approach for determining the effectiveness of the management practices implemented must be described. Acceptable approaches include field studies of management practices at representative sites and modeling or assessment to associate the degree of management practice implementation to changes in water quality. The process for tracking implementation of management practices must also be described. The process must include a description of how the information will be collected from growers, the type of information being collected, how the information will be verified, and how the information will be reported.

G. Records and Reporting

If a SQMP or GQMP is required, the CRC must prepare a Management Plan Progress Report by 1 May of each year that summarizes the progress in implementing management plans. The

Management Plan Progress Report must summarize the progress for the hydrologic water year.²The Management Plan Progress Report shall include the following components:

- (1) Title page
- (2) Table of contents
- (3) Executive Summary
- (4) Location map(s) and a brief summary of management plans covered by the report
- (5) Updated table that tallies all exceedances for the management plans
- (6) A list of new management plans triggered since the previous report
- (7) Status update on preparation of new management plans
- (8) A summary and assessment of management plan monitoring data collected during the reporting period
- (9) A summary of management plan grower outreach conducted
- (10) A summary of the degree of implementation of management practices
- (11) Results from evaluation of management practice effectiveness
- (12) An evaluation of progress in meeting performance goals and schedules
- (13) Any recommendations for changes to the management plan

II. Approval and Review of the Management Plan

The following discussion describes the review and approval process for draft management plans submitted to the Executive Officer for approval. In approving the Management Plan, the Executive Officer is concurring that the proper implementation of the identified practices (or equivalently effective practices) should result in addressing the water quality problem that triggered the preparation of the Management Plan. The Executive Officer is also concurring that any proposed schedules or interim milestones are consistent with the requirements in section XII of the Order, Time Schedule for Compliance. Any proposed changes to the management plan must be approved by the Executive Officer prior to implementation.

- a. Water quality management plan approval – Prior to Executive Officer approval of any management plan, the Central Valley Water Board will post the draft management plan on its website for a review and comment period. Central Valley Water Board staff will consider stakeholder comments. Based on information provided by the CRC and after consideration of comments provided by other interested stakeholders, the Central Valley Water Board's Executive Officer will either: (1) approve the management plan; (2) conditionally approve the management plan or (3) disapprove the management plan. Review of the management plan and the associated action by the Executive Officer will be based on findings as to whether the plan meets program requirements and goals and contains all of the information required for a management plan.
- b. Periodic review of water quality management plans – At least once every five years, the Central Valley Water Board intends to review available data to determine whether the approved management plan is resulting in water quality improvements. Central Valley Water Board staff will meet with the CRC and other interested parties to evaluate the adequacy of management plans. Based on input from all parties, the Executive Officer will determine whether and how the management plan should be updated based on new information and progress in achieving compliance with the Order's surface or groundwater receiving water limitations, as applicable (see section III of the Order). The Executive Officer also may require revision of the management plan based on available information indicating that rice land waste discharges are

² A hydrologic water year is defined as 1 October through 30 September.

not in compliance with surface or groundwater receiving water limitations (as applicable) of the Order. The Executive Officer may also require revision to the management plan if available information indicates that degradation of surface and/or groundwater calls for the inclusion of additional areas, constituents of concern(s), or improved management practices in the management plan. During this review, the Executive Officer will make one of the findings described below:

1. Adequate progress – The Executive Officer will make a determination of adequate progress in implementing the plan if water quality improvement milestones and compliance time schedules have been met or the surface/groundwater receiving water limitations of the Order are met.
2. Inadequate progress – The Executive Officer will make a determination of inadequate progress in implementing the plan if the Order's surface or groundwater receiving water limitations are not being met; and water quality improvement milestones and compliance time schedules in the approved management plan have not been met.

The actions taken by the Executive Officer upon a determination of inadequate progress include, but are not limited to one or more of the following for the area in which inadequate progress has been made:

- Management practice field monitoring studies – The CRC may be required to develop and implement a field monitoring study plan to characterize the rice-specific discharge of the constituent of concern and evaluate the pollutant reduction efficacy of specific management practices. Based on the study and evaluation, the Executive Officer may require the SQMP/GQMP to be revised to include additional practices to achieve compliance with the Order's surface and groundwater receiving water limitations.
- Independent, on-site verification of implementation of management practices and evaluation of their adequacy.
- Individual WDRs or waiver of WDRs – The board may revoke the CRC coverage for individual irrigated agricultural operations and require submittal of a report of waste discharge.

III. Management Plan Completion

Management Plans can be completed in one of two ways. The first way a Management Plan can be completed is if an approved source study shows that irrigated agriculture is not causing or contributing to the water quality problem. The second way a Management Plan can be completed is if the improved management practices have resolved the water quality problem.

The goal of all management plans is to identify the source(s) of COCs, track the implementation of effective management practices, and ultimately ensure that irrigated agriculture waste discharges are meeting the surface and groundwater receiving water limitations of the Order. If an approved source study shows that rice land is not a source, then the CRC can request the Executive Officer to approve completion of the associated management plan.

A request for approval of completion of a management plan due to improved management practices will require credible evidence that the water quality problem has been resolved. The Executive Officer will evaluate each request on a case-by-case basis. The following key components must be addressed in the request:

- a) Demonstration through evaluation of monitoring data that the water quality problem is no longer occurring (i.e., 3 or more years with no exceedances during the times of the year when previous

exceedances occurred³) or demonstrated compliance with the Order's surface and groundwater receiving water limitations.

- b) Documentation of CRC education and outreach to applicable Growers in the watershed where water quality impairment occurred.
- c) Documentation of Growers implementation of management practices that address the water quality exceedances.
- d) Demonstration that the management practices implemented by Growers are effective in addressing the water quality problem.

Management plans may be completed for all or some of the constituents that prompted preparation of the management plan. When Executive Officer approval is given for completion of a management plan for one or more constituents, each constituent shall revert to regular, ongoing monitoring requirements (as described in the MRP). The CRC must also continue tracking on-going implementation of appropriate management practices by Growers, which may be done through the Farm Evaluation process.

Requests for management plan completion must summarize and discuss all information and data being used to justify completion. The CRC shall not discontinue any of the associated management plan requirements prior to Executive Officer approval of its completion request.

³ The demonstration must include consideration of periods of peak use and/or periods when a parameter is likely to be present.

Monitoring and Reporting Program R5-2014-0032
Appendix MRP-2

Monitoring Well Installation and Sampling Plan
and
Monitoring Well Installation Completion Report

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MRP-2 Monitoring Well Installation and Sampling Plan and Monitoring Well Installation Completion Report

I. Introduction

The provisions of Appendix MRP-2 are set out pursuant to the Central Valley Water Board's authority under California Water Code (CWC) section 13267. The purpose and requirements of the Management Practice Evaluation Program (MPEP) are set forth in Monitoring and Reporting Program (MRP) R5-2014-0032.

Implementation of the MPEP, if applicable, requires that the CRC develop and submit a Monitoring Well Installation and Sampling Plan (MWISP) to the Executive Officer for approval prior to installation of monitoring wells. Stipulations and required elements of the MWISP are presented in section II below.

Upon completion of any monitoring well network, the CRC shall submit to the Central Valley Water Board a Monitoring Well Installation Completion Report (MWICR) which describes the field activities performed during that phase of the work. Required elements to be included in the MWICR are presented in section III below.

II. Monitoring Well Installation and Sampling Plan

Prior to installation of groundwater monitoring wells, an MWISP and schedule prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology shall be submitted to the Central Valley Water Board for Executive Officer approval. If the CRC has chosen to rank or prioritize its high vulnerability areas, the initial MWISP must present an overview and justification for the phased approach. Separate MWISPs showing the proposed monitoring well locations are required prior to implementation of each phase (alternatively, CRC may prepare a master MWISP covering all of the proposed phases of well installation). Installation of monitoring wells shall not begin until the Executive Officer notifies the CRC in writing that the MWISP is acceptable. The MWISP or an MWISP for the initial phase if the CRC has chosen to employ a phased approach must be submitted within 180 days after Executive Officer approval of the Management Practices Evaluation Workplan (see section IV of Monitoring and Reporting Program Order R5-2014-0032, "MRP").

A. Stipulations

1. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the well (including the annular space outside of the well casing) from acting as a conduit for waste/contaminant transport. Each monitoring well shall be appropriately designed and constructed to enable collection of representative samples of the first encountered groundwater.
2. Where applicable, the CR shall follow state, county or local agency standards with respect to water wells and groundwater quality when constructing new wells, modifying existing wells, or destroying wells. Absent such standards, at a minimum, the CRC shall follow the standards and guidelines described in the California Department of Water Resources' *Water Well Standards (Bulletins 74-81 & 74-90 combined)*. More stringent practices shall be implemented if needed to prevent the well from acting as a conduit for the vertical migration of waste constituents.
3. The horizontal and vertical position of each monitoring well shall be determined by a registered land surveyor or other qualified professional. The horizontal position of each monitoring well shall be measured with one-foot lateral accuracy using the North American Datum 1983

(NAD83 datum). The vertical elevations of each monitoring well, at the point where depth to groundwater shall be measured to an absolute accuracy of at least 0.5 feet and a relative accuracy between monitoring wells of 0.01 feet referenced to the North American Vertical Datum 1988 (NAVD88 datum).

4. Once the groundwater monitoring network is installed pursuant to an approved MWISP, the CRC shall sample monitoring wells for the constituents and at the frequencies as specified in the approved MPEP. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest annual water table levels and be of sufficient frequency to allow for evaluation of any seasonal variations.
5. Groundwater samples from monitoring wells shall be collected as specified in an approved MWISP and in accordance with the CRC's approved QAPP.

B. MWISP Required Elements

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

1. General Information:
 - a. Topographic map showing any existing nearby (about 2,000 feet) domestic, irrigation, municipal supply, and known monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features, as reasonably known and appropriate.
 - b. Site plan showing proposed well locations, other existing wells, unused and/or abandoned wells, and major physical site structures (such as tailwater retention systems, pumping stations, irrigation canals, etc.).
 - c. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater. This information must include an explanation of how the location, number, and depths of wells proposed will result in the collection of data that can be used to assess groundwater at farms not directly monitored by the MPEP and under a variety of hydrogeologic conditions
 - d. Local permitting information (as required for drilling, well seals, boring/well abandonment).
 - e. Drilling details, including methods and types of equipment for drilling and soils logging activities. Equipment decontamination procedures (as appropriate) should be described.
 - f. Health and Safety Plan.
2. Proposed Drilling Details:
 - a. Drilling techniques.
 - b. Well/soil sample collection and logging method(s).
3. Proposed Monitoring Well Design - all proposed well construction information must be displayed on a construction diagram or schematic. For items f. through i., the vertical location of all annular materials (filter pack, seals, etc.) shall be shown and a description of the material and its method of emplacement given. The construction diagram or schematic shall accurately identify the following:
 - a. Well depth.
 - b. Borehole depth and diameter.
 - c. Well construction materials.
 - d. Casing material and diameter - include conductor casing, if appropriate.

- e. Location and length of perforation interval, size of perforations, and rationale.
 - f. Location and thickness of filter pack, type and size of filter pack material, and rationale.
 - g. Location, thickness, and composition of any intermediate seal.
 - h. Location, thickness, and composition of annular seal.
 - i. Surface seal depth and composition.
 - j. Type of well cap(s).
 - k. Type of well surface completion.
 - l. Well protection devices (such as below-grade water-tight vaults, locking steel monument, bollards, etc.).
4. Proposed Monitoring Well Development:
 - a. Schedule for development (not less than 48 hours or more than 10 days after well completion).
 - b. Method of development.
 - c. Method of determining when development is complete.
 - d. Parameters to be monitored during development.
 5. Proposed Surveying:
 - a. How horizontal and vertical position of each monitoring well will be determined.
 - b. The accuracy of horizontal and vertical measurements to be obtained.
 6. Proposed Groundwater Monitoring: refer to Monitoring and Reporting Program Order R5-2014-0032 and QAPP Guidelines.

III. Monitoring Well Installation Completion Report (MWICR)

Within 60 days after completion of any monitoring well network, the CRC shall submit to the Executive Officer a Monitoring Well Installation Completion Report (MWICR) prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. In cases where monitoring wells are completed in phases or completion of the network is delayed for any reason, monitoring well construction data are to be submitted within 90 days of well completion, even if this requires submittal of multiple reports. At a minimum, the MWICR shall summarize the field activities as described below.

1. General Information:
 - a. Brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
 - b. A site plan depicting the positions of the newly installed monitoring wells, other existing wells, unused and/or abandoned wells, and major physical site structures (such as tailwater retention systems, pumping stations, irrigation canals, etc.).
 - c. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).
2. Monitoring Well Construction:
 - a. Number and depths of monitoring wells installed.
 - b. Monitoring well identification (i.e., numbers).
 - c. Date(s) of drilling and well installation.

- d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
 - e. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
 - f. Name of drilling company, driller, and logger (site geologist/engineer to be identified).
 - g. As-builts for each monitoring well with the following details:
 - i. Well identification
 - ii. Total borehole and well depth.
 - iii. Date of installation.
 - iv. Boring diameter.
 - v. Casing material and diameter (include conductor casing, if appropriate).
 - vi. Location and thickness of slotted casing, perforation size.
 - vii. Location, thickness, type, and size of filter pack.
 - viii. Location, thickness, and composition of any intermediate seal.
 - ix. Location, thickness, and composition of annular seal.
 - x. Surface seal depth and composition.
 - xi. Type of well cap.
 - xii. Type of surface completion.
 - xiii. Depth to water (note any rises in water level from initial measurement) and date of measurement.
 - xiv. Well protection device (such as below-grade water-tight vaults, stovepipe, bollards, etc.).
 - xv. Lithologic log and electric log (if conducted) of well borings
 - xvi. Results of all soil tests (e.g., grain size, permeability, etc.)
 - h. All depth to groundwater measurements during field program.
 - i. Field notes from drilling and installation activities (e.g., subcontractor dailies, as appropriate).
 - j. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.
3. Monitoring Well Development:
- a. Date(s) and time of development.
 - b. Name of developer.
 - c. Method of development.
 - d. Methods used to identify completion of development.
 - e. Development log: volume of water purged and measurements of temperature, pH, electrical conductivity, and any other parameters measured during and after development.
 - f. Disposition of development water.
 - g. Field notes (such a bailing to dryness, recovery time, number of development cycles).
4. Monitoring Well Survey:
- a. Identify coordinate system or reference points used.
 - b. Description of measuring points (e.g., ground surface, top of casing, etc.).

- c. Horizontal and vertical coordinates of well casing with cap removed (measuring point where water levels are measured to nearest + 0.01 foot).
- d. Name, license number, and signature of California licensed professional who conducted survey.
- e. Surveyor's field notes.
- f. Tabulated survey data.

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

**ATTACHMENT C TO ORDER NO. R5-2014-0032
CEQA MITIGATION MEASURES**

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
SACRAMENTO VALLEY RICE GROWERS**

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I. Cultural Resources

A. Mitigation Measure CUL-MM-1: Avoid Impacts to Cultural Resources

The measure described below will reduce the severity of impacts on significant cultural resources, as defined and described in sections 5.3.1 and 5.3.3 of the PEIR¹. Avoidance of such impacts also can be achieved when Growers choose the least impactful management practices that will meet quality improvement goals and objectives of Waste Discharge Requirements General Order for Rice Growers in the Sacramento Valley, Order R5-2014-0032 (hereafter referred to as "Order"). Note that these mitigation measures may not be necessary in cases where no ground-disturbing activities would be undertaken as a result of the Order.

Although cultural resource inventories and evaluations typically are conducted prior to preparation of a CEQA document, the size of the Order's coverage area and the lack of specificity regarding the location and type of management practices that would be implemented following adoption of the Order rendered conducting inventories prior to release of the draft Order untenable. Therefore, where the Order's water quality improvement goals cannot be achieved without modifying or disturbing an area of land or existing structure to a greater degree than through previously employed farming practices, individual Growers (or third-party representatives) will implement the following measures to reduce potential impacts to less-than-significant levels:

- Where construction within areas that may contain cultural resources cannot be avoided through the use of alternative management practices, conduct an assessment of the potential for damage to cultural resources prior to construction; this may include the hiring of a qualified cultural resources specialist to determine the presence of significant cultural resources.
- Where the assessment indicates that damage may occur, submit a non-confidential records search request to the appropriate California Historical Resources Information System (CHRIS) center(s).
- Implement the recommendations provided by the CHRIS information center(s) in response to the records search request.
- Where adverse impacts to cultural resources cannot be avoided, the grower's coverage under this Order is not authorized. The grower must then apply for its own individual waste discharge requirements. Issuance of individual waste discharge requirements would constitute a future discretionary action by the Board subject to additional CEQA review.

In addition, California state law provides for the protection of interred human remains from vandalism and destruction. According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (section 8100), and the disturbance of Native American cemeteries is a felony (section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of the discovered human remains until the County Coroner has been notified, according to California Public Resource Code (PRC)

¹ ICF International. 2011. *Irrigated Lands Regulatory Program Final Program Environmental Impact Report*. Final and Draft. March. (ICF 05508.05) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA

section 5097.98, and can determine whether the remains are those of Native American origin. If the coroner determines that the remains are of Native American origin, the coroner must contact the Native American Heritage Commission (NAHC) within 24 hours (Health and Safety Code section 7050[c]). The NAHC will identify and notify the most likely descendant of the interred individual(s), who will then make a recommendation for means of treating or removing, with appropriate dignity, the human remains and any associated grave goods as provided in PRC section 5097.98.

PRC section 5097.9 identifies the responsibilities of the project proponent upon notification of a discovery of Native American burial remains. The project proponent will work with the most likely descendant (determined by the NAHC) and a professional archaeologist with specialized human osteological experience to develop and implement an appropriate treatment plan for avoidance and preservation of, or recovery and removal of, the remains.

Growers implementing management practices should be aware of the following protocols for identifying cultural resources:

- If built environment resources or archaeological resources, including chipped stone (often obsidian, basalt, or chert), ground stone (often in the form of a bowl mortar or pestle), stone tools such as projectile points or scrapers, unusual amounts of shell or bone, historic debris (such as concentrations of cans or bottles), building foundations, or structures are inadvertently discovered during ground-disturbing activities, the land owner should stop work in the vicinity of the find and retain a qualified cultural resources specialist to assess the significance of the resources. If necessary, the cultural resource specialist also will develop appropriate treatment measures for the find.
- If human bone is found as a result of ground disturbance, the landowner should notify the County Coroner in accordance with the instructions described above. If Native American remains are identified and descendants are found, the descendants may, with the permission of the owner of the land or his or her authorized representative, inspect the site of the discovery of the Native American remains. The descendants may recommend to the owner or the person responsible for the excavation work means for treating or disposing of the human remains and any associated grave goods, with appropriate dignity. The descendants will make their recommendation within 48 hours of inspection of the remains. If the NAHC is unable to identify a descendant, if the descendants identified fail to make a recommendation, or if the landowner rejects the recommendation of the descendants, the landowner will inter the human remains and associated grave goods with appropriate dignity on the property in a location not subject to further and future subsurface disturbance.

II. Vegetation and Wildlife

A. Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources

Implementation of the following avoidance and minimization measures would ensure that the construction activities related to implementation of management practices and installation of monitoring wells on rice lands will minimize impacts on sensitive vegetation communities (such as riparian habitat and wetlands adjacent to the construction area) and special-status plants and wildlife species as defined and listed in section 5.7.3 of the PEIR. In each instance where particular management practices could result in impacts on the biological resources listed above, Growers should use the least impactful effective management practice to avoid such impacts. Where Order's water quality improvement

goals cannot be achieved without incurring potential impacts, individual Growers will implement the following measures to reduce potential impacts to less-than-significant levels:

- Where construction in areas that may contain sensitive biological resources cannot be avoided through the use of alternative management practices, conduct an assessment of habitat conditions and the potential for presence of sensitive vegetation communities or special-status plant and animal species prior to construction. This may include the hiring of a qualified biologist to identify riparian and other sensitive vegetation communities and/or habitat for special-status plant and animal species.
- Avoid and minimize disturbance of riparian and other sensitive vegetation communities.
- Avoid and minimize disturbance to areas containing special-status plant or animal species.
- Where adverse impacts on sensitive biological resources cannot be avoided, the grower's coverage under this Order is not authorized. The grower must then apply for its own individual waste discharge requirements. Issuance of individual waste discharge requirements would constitute a future discretionary action by the board subject to additional CEQA review.

III. Fisheries

A. Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat

This mitigation measure incorporates all measures identified in Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources. In each instance where particular management practices could result in impacts to special-status fish species (see "Regulatory Classification of Special-Status Species" in section 5.8.2 of the PEIR), Growers should use the least impactful effective management practice to avoid such impacts. When the Order's water quality improvement goals cannot be achieved without incurring potential impacts, individual Growers, or third-party representatives will implement the following measures to reduce potential impacts to less-than-significant levels. Note that these measures may not be necessary in many cases and are dependent on the location of construction in relation to water bodies containing special-status fish:

- Where construction in areas that may contain special-status fish species cannot be avoided through the use of alternative management practices, conduct an assessment of habitat conditions and the potential for presence of special-status fish species prior to construction; this may include the hiring of a qualified fisheries biologist to determine the presence of special status fish species.
- Based on the species present in adjacent water bodies and the likely extent of construction work that may affect fish, limit construction to periods that avoid or minimize impacts to special-status fish species.
- Where construction periods cannot be altered to minimize or avoid impacts on special-status fish, the grower's coverage under this Order is not authorized. The Grower must then apply for its own individual waste discharge requirements. Issuance of individual waste discharge requirements would constitute a future discretionary action by the Board subject to additional CEQA review.

IV. Climate Change

A. Mitigation Measure CC-MM-1: Apply Applicable Air District Mitigation Measures to Reduce Construction and Operational GHG Emissions

Several of the standard mitigation measures provided by Central Valley local air districts to reduce criteria pollutant emissions would also help to minimize GHG emissions (see section 5.6.5 of the PEIR). Measures to reduce vehicle trips and promote use of alternative fuels, as well as clean diesel technology and construction equipment retrofits, should be considered by rice operations under the Order.

B. Mitigation Measure CC-MM-2: Apply Applicable California Attorney General Mitigation Measures to Reduce Construction and Operational GHG Emissions

A 2008 report by the California Attorney General's office entitled *The California Environmental Quality Act: Addressing Global Warming at the Local Agency Level* identifies various example measures to reduce GHG emissions at the project level (California Department of Justice 2008). The following mitigation measures and project design features were compiled from the California Attorney General's Office report. They are not meant to be exhaustive but to provide a sample list of measures that should be incorporated into future project design. Only those measures applicable to the Rice Order are included.

Solid Waste Measures

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).
- Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers.
- Recover by-product methane to generate electricity.

Transportation and Motor Vehicles

- Limit idling time for commercial vehicles, including delivery and construction vehicles.
- Use low- or zero-emission vehicles, including construction vehicles.

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

ATTACHMENT D TO ORDER NO. R5-2014-0032

**FINDINGS OF FACT AND STATEMENT OF OVERRIDING CONDERATIONS
WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
SACRAMENTO VALLEY RICE GROWERS**

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Acronyms and Abbreviations

AB	Assembly Bill
Antidegradation Policy	State Water Board Resolution 68-16
CCR	California Code of Regulations
Central Valley Water Board	California Regional Water Quality Control Board, Central Valley Region
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CRC	California Rice Commission
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
DPH	California Department of Public Health
DPM	diesel particulate matter
DPR	California Department of Pesticide Regulation
Economics Report	Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program
ECR	Existing Conditions Report for the Irrigated Lands Regulatory Program
EIR	environmental impact report
ESA	Endangered Species Act
FFGO	field crops, grain and hay, irrigated pasture, rice
Framework	Recommended Long-Term Irrigated Lands Regulatory Program Framework
GHG	greenhouse gas
GQMPs	groundwater quality management plans
HAPs	hazardous air pollutants
ILRP	Long-Term Irrigated Lands Regulatory Program
ILRP Framework Report	Recommended Irrigated Lands Regulatory Program Framework Staff Report, March 2011
NAHC	Native American Heritage Commission
NMFS	National Marine Fisheries Service
NOA	naturally occurring asbestos
NPS Policy	State Water Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program
NRHP	National Register of Historic Places
PAMs	polyacrylamides
PEIR	Final Program EIR for the Long-Term Irrigated Lands Regulatory Program (incorporates Draft)
PRC	California Public Resources Code
Rice Order	Waste Discharge Requirements General Order for Sacramento Valley Rice Growers
SB	Senate Bill
State Water Board	State Water Resources Control Board
TACs	toxic air contaminants
TMDLs	total maximum daily loads
USFWS	United States Fish & Wildlife Service
WDRs	waste discharge requirements

I. Introduction

The California Environmental Quality Act (CEQA) (California Public Resources Code [PRC] sections 21002, 21002.1, 21081, 21081.5, 21100) and State CEQA Guidelines section 15091(a) provide that no public agency shall approve or carry out a project for which an environmental impact report (EIR) has been certified when one or more significant environmental effects of the project have been identified, unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. These findings explain the disposition of each of the significant effects, including those that will be less than significant with mitigation. The findings must be supported by substantial evidence in the record.

There are three possible findings under section 15091(a). The public agency must make one or more of these findings for each significant effect. The section 15091(a) findings are:

1. Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Long-Term Irrigated Lands Regulatory Program (ILRP) Final Program EIR (PEIR) (ICF International 2011). Pub. Resources Code section 15091(a)(1).
2. Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency. Pub. Resources Code section 15091(a)(2).
3. Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the PEIR. Pub. Resources Code section 15091(a)(3).

II. Findings

The findings in the *Impact Findings* (section II.C) discuss the significant direct, indirect, and cumulative effects of the program to be adopted, which is referred to throughout as Waste Discharge Requirements General Order for Rice Growers in the Sacramento Valley, Order R5-2014-0032 (Order). The Order is described in California Regional Water Quality Control Board, Central Valley Region Order R5-2014-0032 and supporting attachments, and is being approved consistent with the requirements of CEQA.

The requirements of this Order have been developed from the alternatives evaluated in the PEIR, and include regulatory elements contained within those alternatives. As described below (see Applicability of the Program EIR), there are no new effects that could occur or no new mitigation measures that would be required as a result of the Order that were not already identified and described in the PEIR. None of the conditions that would trigger the need to prepare a subsequent EIR under State CEQA Guidelines section 15162 exist with respect to the Order.

The findings adopted by the Central Valley Water Board address each of the Order's significant effects in their order of appearance in the PEIR certified for the Long-term ILRP. The findings also address the alternatives analyzed in the PEIR that were not selected as a basis for the Order.

For the purposes of section 15091, the documents and other materials that constitute the record of proceedings upon which the Central Valley Water Board based its decision are held by the Central Valley Water Board.

For findings made under section 15091(a)(1), required mitigation measures have been adopted for the Order. These mitigation measures are described in the *Mitigation Measures* below (section II.D) and are included in Attachment C of the Order. A Mitigation Monitoring and Reporting Program

(MMRP) for these measures has been included in the Order's Monitoring and Reporting Program R5-2014-0032 (MRP).

Where mitigation measures are within the responsibility and jurisdiction of another public agency, the finding in section 15091(a)(2) should be made by the lead agency. In order to make the finding, the lead agency must find that the mitigation measures have been adopted by the other public agency or can and should be adopted by the other public agency.

Where the finding is made under section 15091(a)(3) regarding the infeasibility of mitigation measures or alternatives, the specific economic, legal, social, technological, or other considerations are described in a subsequent section.

Each of these findings must be supported by substantial evidence in the record.

The Order implements the Long-Term ILRP for rice operations in the Sacramento Valley. The Order is intended to serve as a single implementing order in a series of orders that will implement the Long-Term ILRP for the entire Central Valley.

A. History of the Project

In 2003 the Central Valley Water Board adopted a conditional waiver of waste discharge requirements for discharges from irrigated agricultural lands. As part of the 2003 waiver program the Central Valley Water Board directed staff to prepare an Environmental Impact Report (EIR) for a long-term irrigated lands regulatory program (ILRP).

On 5 and 6 March 2003, CEQA scoping meetings were held in Fresno and Sacramento to solicit and receive public comment on the scope of the EIR as described in the Notice of Preparation (released on 14 February 2003). Following the scoping meetings, the Central Valley Water Board began preparation of the draft *Existing Conditions Report* (ECR) in 2004 to assist in defining the baseline condition for the EIR's environmental analyses. The draft ECR was circulated in 2006, public comment on the document was received and incorporated and it was released in 2008.¹

In March and April 2008, the Central Valley Water Board conducted another series of CEQA scoping meetings to generate recommendations on the scope and goals of the long-term ILRP. Information was also gathered as to how stakeholders would like to be involved in development of the long-term program. Stakeholders indicated in these scoping meetings that they would like to be actively involved in developing the program. To address this interest, the Central Valley Water Board initiated the Long-term ILRP Stakeholder Advisory Workgroup. The Stakeholder Advisory Workgroup assisted in the development of long-term program goals and objectives and a range of alternatives to be considered in the PEIR.

On 28 July 2010, the Central Valley Water Board, serving as the lead agency under CEQA, released the Draft PEIR for the long-term ILRP. The PEIR provides programmatic analysis of impacts resulting from the implementation of six regulatory alternatives. Five of the alternatives were developed with the Stakeholder Advisory Workgroup. The sixth alternative was developed by staff in an effort to fulfill program goals and objectives, meet applicable state policy and law, and minimize potentially adverse environmental impacts and economic effects. The PEIR does not analyze a preferred program alternative, but rather equally analyzes the environmental impacts of each alternative. Further discussion regarding the PEIR alternatives is included below in the section titled "Feasibility of alternatives Considered in the EIR."

¹ ICF Jones & Stokes. 2008. *Irrigated Lands Regulatory Program Existing Conditions Report*. December. (ICF J&S 05508.05.) Sacramento, CA. Prepared for the State Water Resources Control Board and Central Valley Regional Water Quality Control Board, Rancho Cordova, CA.

The Central Valley Water Board provided a 60-day period for submitting written comments on the Draft PEIR. In September 2010, Central Valley Water Board staff held public workshops in Chico, Modesto, Rancho Cordova, and Tulare to receive input. The Central Valley Water Board provided substantive responses to all written comments received on the Draft PEIR. The Central Valley Water Board provided public notice of the availability of the Final PEIR on 8 March 2011. The Central Valley Water Board certified the PEIR on 7 April 2011 (Central Valley Water Board Resolution R5-2011-0017). In December 2012, the board adopted a long-term ILRP third-party order for the Eastern San Joaquin River Watershed. The board also adopted a general order for irrigated lands owners/operators that are not part of a third-party group in July 2013, and third-party group general orders for the Tulare Lake Basin [September 2013], the Western Tulare Lake Basin Area [January 2014], and the Western San Joaquin River Watershed [January 2014]. The requirements of the Order have been developed from the alternatives evaluated in the PEIR.

B. Applicability of the Program EIR

Pursuant to Guidelines Section 15168(c)(2), the Central Valley Water Board finds that the Order is within the scope of the project covered by the PEIR, and no new environmental document is required. There are no new effects that could occur or no new mitigation measures that would be required as a result of the Order that were not already identified and described in the PEIR. None of the conditions that would trigger the need to prepare a subsequent EIR under State CEQA Guidelines section 15162 exist with respect to the Order.

This Order represents one order in a series of orders that will be developed, based on the alternatives evaluated in the PEIR, for all irrigated agriculture within the Central Valley. The PEIR describes that potential environmental impacts of all six alternatives are associated with implementation of water quality management practices, construction of monitoring wells, and impacts to agriculture resources (e.g., loss of production of prime farmland) due to increased regulatory costs.

The PEIR describes and evaluates potential impacts of practices likely to be implemented to meet water quality and other management goals on irrigated lands. The representative types of water quality management practices analyzed that are applicable to rice operations include:

- Nutrient management
- Wellhead protection

As discussed in Attachment A, the requirements of the Order have been developed from the alternatives evaluated in the PEIR. Because the Order includes regulatory elements that are also contained in the six alternatives analyzed in the PEIR, the actions by Growers to protect water quality in response to the requirements of this Order are expected to be similar to those described for Alternatives 2-6 of the PEIR (Alternative 1 does not include groundwater protection). Therefore, the requirements of this Order would lead to implementation of the above practices within the Sacramento Valley to a similar degree as is described for Alternatives 2-6 analyzed in the PEIR.

Specifically, project-level review of the requirements in the Order has revealed that the requirements of the Order most closely resemble those described for Alternatives 2 and 4 of the PEIR, but do include elements from Alternatives 2-5. The Order contains the third-party lead entity structure, regional surface and groundwater management plans, regional surface water quality monitoring approach similar to Alternative 2 of the PEIR; farm planning, management practices tracking, nutrient tracking, and regional groundwater monitoring similar to Alternative 4 of the PEIR; prioritized installation of groundwater monitoring wells similar to Alternative 5; and a prioritization system based on systems described by Alternatives 2 and 4.

Potential impacts identified in the PEIR not applicable to the Order

The PEIR analyzed several representative management practices and identified a wide range of potential environmental impacts that may result from management practice implementation. Potentially significant impacts identified in the PEIR may be caused by management practices to be implemented by both rice and non-rice irrigated agricultural operations. Because the Order applies only to rice growing operations in the Sacramento Valley, many of the potentially significant impacts identified in the PEIR will not occur as a result of the Order, and therefore are considered less than significant potential impacts of the Order. These less-than-significant potential impacts are referenced below as “non-applicable potential impacts.”

Examples of program actions to protect water quality with potentially significant impacts that have been evaluated in the PEIR, but would not be implemented by rice operations in response to the Order, include:

- Pressurized irrigation systems
- Cover cropping,
- Sediment basins
- Tailwater return systems
- Buffers
- Irrigation water management

Pressurized irrigation systems are not used on rice fields in the Sacramento Valley as rice fields are flooded for extended periods; for this same reason, cover crops are not planted by rice operations. All rice field operators subject to the Order flood their fields for extended periods and the fields essentially function as sediment basins and tailwater return systems. This is reflected in the economic evaluation² for the ILRP (hereafter referred to as the “Economics Report”), indicating that 100 percent of rice operations have tailwater recovery system capabilities. Because rice operations hold water for these extended periods and control release from designated locations, buffers for sediment control are not necessary.

The Economics Report also describes that 100 percent of rice operations already have irrigation water management practices in place. Therefore, these practices are already implemented on all rice fields and there would not be any additional irrigation water management practices deployed as a result of the Order.

The non-applicable potential impacts are briefly described below.

Impact BIO-1: Loss of Downstream Habitat from Reduced Field Runoff. This impact is due to implementation of practices that would reduce field runoff (PEIR, pg. 5.7-45). The representative practices that rice operations may implement to comply with the Order do not include any new practices that would reduce field runoff. Under the Order, Impact BIO-1 is not applicable and is therefore less-than-significant.

Impacts BIO-4 and BIO-5: Potential Impacts Associated with Loss of Existing Sedimentation Ponds. This potential impact is due to the potential for operations to abandon, or fill, existing tailwater/sediment ponds to protect groundwater (PEIR, pg. 5.7-47). Because rice fields function as sediment/tailwater ponds (see discussion above), rice growers regulated under the Order would not fill or abandon sediment/tailwater ponds. This practice is not expected to be implemented by rice

² ICF International. 2010. *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program*. July. (ICF 05508.05.) Sacramento, CA. Prepared for: Central Valley Regional Water Quality Control Board, Sacramento, CA.

operations to comply with the Order. Under the Order, Impacts BIO-4 and BIO-5 are not applicable, and are therefore less-than-significant.

Impact FISH-4: Toxicity to Fish or Fish Prey from Particle-Coagulant Water Additives. This potential impact is due to the application of polyacrylamides (PAMs) as a practice to reduce erosion and sediment runoff (PEIR, pg. 5.8-51). As described above, rice fields function as sediment basins, which reduce erosion and sediment runoff. Because rice operations already control sediment and erosion, application of PAMs to comply with the Order is not expected to occur. Under the Order, Impact FISH-4 is not applicable, and is therefore less-than-significant.

Impact AG-1: Conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to Nonagricultural Use. This impact is due to the potential conversion of important farmland to nonagricultural use due to increased regulatory costs (e.g., monitoring, reporting, management practices implementation). The PEIR states that most of the potential loss would be where growers of low-value crops select relatively costly management practices. Rice operations would not be implementing higher cost management practices (see Table 2-9, Economics Report) and rice operations are relatively high value crops (see pg. 3-6, Economics Report, rice value exceeding \$1000 per acre versus \$200 per acre for irrigated pasture). Therefore, the costs to rice operations are substantially lower than other irrigated agricultural operations. As provided in the Information Sheet, the costs of the Order are similar to the costs for Alternative 4 of the PEIR. Potential loss of important rice farmland under Alternative 4 is expected to be less than 300 acres, which is less than the margin of error inherent in the model used by the Economics Report.³ Because the estimated loss is less than the margin of error, the potential effect is effectively zero. Therefore, there is no potential loss of important rice farmland under the Order, and this potential impact is considered less-than-significant.

Cumulative Agriculture Resources Impacts. In the PEIR, the Program's contribution to the increasing conversion of important agriculture resources statewide was identified as cumulatively considerable. However, given, as described above, that the expected conversion of important farmland from implementation of the Order is effectively zero, the Order would not contribute to a cumulatively considerable impact to agriculture resources. Under the Order, this potential impact is considered less-than-significant.

C. Impact Findings

1. Cultural Resources

Impact CUL-1. Physical destruction, alteration, or damage of cultural resources from implementation of management practices (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental effect as identified in the PEIR.

³ Hatchett, S. 2013. Pursuant to State CEQA Guidelines section 15164, the Board has considered the 2013 Hatchett memorandum in addition to the PEIR prior to making a decision on the Order. None of the conditions that would trigger the need to prepare a subsequent EIR under CEQA exist with respect to information contained in the Hatchett memorandum.

Rationale for Finding

Upon implementation of the Order, Growers may implement a variety of management practices that include physical and operational changes to agricultural land in the Order's regulated area. Such management practices may occur near cultural resources that are historically significant and eligible for listing in the California Register of Historic Resources (CRHR) or the National Register of Historic Places (NRHP). Implementation of these practices may lead to physical demolition, destruction, relocation, or alteration of cultural resources.

The location, timing, and specific suite of management practices to be chosen by Growers to improve water quality are not known at this time. This impact is considered significant. **Mitigation Measure CUL-MM-1: Avoid Impacts to Cultural Resources** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measures are included in the *Mitigation Measures* section II.D.1.

Impact CUL-2. Potential Damage to Cultural Resources from Construction Activities and Installation of Groundwater Monitoring Wells (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental impact as identified in the PEIR.

Rationale for Finding

Under the Order, construction impacts would result from installation of groundwater monitoring wells. The location of monitoring wells, as well as the location, timing, and specific suite of constituents to be monitored will not be defined until the need for additional monitoring wells is established. This impact is considered significant. **Mitigation Measure CUL-MM-1: Avoid Impacts to Cultural Resources** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measures are included in the *Mitigation Measures* section II.D.1.

2. Noise

Impact NOI-1. Exposure of Sensitive Land Uses to Noise from Construction Activities in Excess of Applicable Standards (Responsibility of Other Agencies)

Finding

As specified in section 15091(a)(2) of the State CEQA Guidelines, implementation of the mitigation measures for this impact is within the responsibility and jurisdiction of other public agencies that can and should implement the measures.

Rationale for Finding

Under the Order, construction noise impacts would result from implementation of management practices that may require the use of heavy-duty construction equipment. Because management practices are a function of crop type and economics, it cannot be determined whether the management practices selected under this alternative would change relative to existing conditions. Accordingly, it is not possible to determine construction-related effects based on a quantitative analysis.

Noise levels from anticipated heavy-duty construction equipment are expected to range from approximately 55 to 88 A-weighted decibels (dBA) at 50 feet. These levels would be short term and would attenuate as a function of distance from the source. Noise from construction equipment operated within several hundred feet of noise-sensitive land uses has the potential to exceed local noise standards. This is considered a potentially significant impact. Implementation of **Mitigation Measure NOI-MM-1: Implement Noise-Reducing Construction Practices**, which is described in

the *Mitigation Measures* section II.D.2, would reduce this impact to a less-than-significant level. Mitigation Measure NOI-MM-1 is within the responsibility and jurisdiction of local agencies, who can and should implement these measures.

Impact NOI-2. Exposure of Sensitive Land Uses to Noise from Operational Activities in Excess of Applicable Standards (Responsibility of Other Agencies)

Finding

As specified in section 15091(a)(2) of the State CEQA Guidelines, implementation of the mitigation measures for this impact is within the responsibility and jurisdiction of other public agencies that can and should implement the measures.

Rationale for Finding

Under the Order, a third-party group would perform regional surface water and groundwater quality monitoring. Surface and groundwater monitoring under the Order would be similar to the regional monitoring described for Alternatives 2 and 4 of the PEIR. The PEIR provides that operational noise from vehicle trips associated with water quality sampling for these alternatives is expected to be minimal.

Noise generated from individual well pumps would be temporary and sporadic. Information on the types and number of pumps, as well as the number and distances of related vehicle trips, is currently unavailable.

Depending on the type of management practice selected, the Order also may result in noise benefits relative to existing conditions. For example, improved irrigation management may reduce the amount of time that pressurized pump generators are used. Enhanced nutrient application may minimize the number of tractors required to fertilize or plow a field. Removing these sources of noise may mediate any increases related to the operation of new pumps. However, in the absence of data, a quantitative analysis of noise impacts related to operations of the Order is not possible. Potential noise from unenclosed pumps located close to noise-sensitive land uses could exceed local noise standards. This is considered a potentially significant impact. Implementation of **Mitigation Measures NOI-MM-1: Implement Noise-Reducing Construction Practices** and **NOI-MM-2: Reduce Noise Generated by Individual Well Pumps**, which are described in the *Mitigation Measures* section II.D.2, should reduce this impact to a less-than-significant level. Mitigation measures NOI-MM-1 and NOI-MM-2 are within the responsibility and jurisdiction of local agencies, who can and should implement these measures.

3. Air Quality

Impact AQ-1. Generation of Construction Emissions in Excess of Local Air District Thresholds (Responsibility of Other Agencies)

Finding

As specified in section 15091(a)(2) of the State CEQA Guidelines, implementation of the mitigation measures for this impact is within the responsibility and jurisdiction of other public agencies that can and should implement the measures..

Rationale for Finding

Under the Order, construction activities would result from implementation of management practices that require physical changes or the use of heavy-duty construction equipment. It is difficult to determine how management practices selected under this Order would change relative to existing conditions. Accordingly, it is not possible to determine construction-related effects based on a quantitative analysis. However, under the Order there would be selection and implementation of additional management practices to meet surface and groundwater quality

goals. Consequently, implementation of the Order may result in increased criteria pollutant emissions from construction activities relative to existing conditions.

Construction emissions associated with the Order would result in a significant impact if the incremental difference, or increase, relative to existing conditions exceeds the applicable air district thresholds shown in Table 5.5-2 of the PEIR. Management practices with the greatest potential for emissions include those that break ground or move earth matter, thus producing fugitive dust, and those that require the use of heavy-duty construction equipment (e.g., backhoes or bulldozers), thus producing criteria pollutants from exhaust.

While it is anticipated that any emissions resulting from construction activities would be miniscule on a per-farm basis, in the absence of a quantitative analysis, data are insufficient to determine whether emissions would exceed the applicable air district thresholds. Consequently, this is considered a potentially significant impact. Implementation of **Mitigation Measure AQ-MM-1: Apply Applicable Air District Mitigation Measures to Reduce Construction Emissions below the District Thresholds**, which is described in the *Mitigation Measures* section II.D.3, should reduce this impact to a less-than-significant level. Mitigation Measure AQ-MM-1 is within the responsibility and jurisdiction of local air districts, who can and should implement these measures.

Impact AQ-2. Generation of Operational Emissions in Excess of Local Air District Thresholds (Responsibility of Other Agencies)

Finding

As specified in section 15091(a)(2) of the State CEQA Guidelines, implementation of the mitigation measures for this impact is within the responsibility and jurisdiction of other public agencies that can and should implement the measures.

Rationale for Finding

Under the Order, operational emissions would result from vehicle trips made by the CRC to perform surface and groundwater monitoring. Because the Order implements regional groundwater monitoring, with sampling wells serving multiple operations, additional stationary sources associated with operating groundwater wells for monitoring are expected to be minimal. Surface water monitoring is already occurring under the existing condition; i.e., the Order's surface water monitoring program is similar to the monitoring being conducted under the previous conditional waiver (Order R5-2006-0053).

Any new emissions generated under the Order are not expected to be substantial or to exceed applicable air district thresholds. However, the difference in emissions relative to existing conditions is not known at this time and therefore cannot be compared to the significance criteria. This is considered a potentially significant impact. Implementation of **Mitigation Measure AQ-MM-2: Apply Applicable Air District Mitigation Measures to Reduce Operational Emissions below the District Thresholds**, which is described in the *Mitigation Measures* section II.D.3, should reduce this impact to a less-than-significant level. Mitigation Measure AQ-MM-2 is within the responsibility and jurisdiction of local air districts, who can and should implement these measures.

Impact AQ-3. Elevated Health Risks from Exposure of Nearby Sensitive Receptors to Toxic Air Contaminants/Hazardous Air Pollutants (TACs/HAPs) (Responsibility of Other Agencies)

Finding

As specified in section 15091(a)(2) of the State CEQA Guidelines, implementation of the mitigation measures for this impact is within the responsibility and jurisdiction of other public agencies that can and should implement the measures.

Rationale for Finding

Toxic air contaminants (TACs) and hazardous air pollutants (HAPs) resulting from the Order include diesel particulate matter (DPM) from diesel construction equipment and new pumps, pesticides/fertilizers, and asbestos. Sensitive receptors near rice growers could be affected by these sources.

As discussed in Chapter 3 of the PEIR, one of the goals of the nutrient management and conservation tillage management practices is to reduce the application of pesticides/fertilizers. Because the Order would result in greater likelihood of these management practices being implemented, it is reasonable to assume that pesticides/fertilizers—and thus the potential for exposure to these chemicals—would be reduced under the Order.

It is expected that construction emissions may increase relative to existing conditions, thus resulting in minor increases of DPM. Elevated levels of construction in areas where naturally occurring asbestos is common may also increase the likelihood of exposure to asbestos. New diesel-powered pumps also would increase DPM emissions relative to existing conditions. This is considered a potentially significant impact. Implementation of **Mitigation Measures AQ-MM-1: Apply Applicable Air District Mitigation Measures to Reduce Construction Emissions below the District Thresholds**, **AQ-MM-2: Apply Applicable Air District Mitigation Measures to Reduce Operational Emissions below the District Thresholds**, and **AQ-MM-3: Apply Applicable Air District Mitigation Measures to Reduce TAC/HAP Emissions**, which are described in *Mitigation Measures* section II.D.3, should reduce this impact to a less-than-significant level). Mitigation Measures AQ-MM-1, AQ-MM-2 and AQ-MM-3 are within the responsibility and jurisdiction of local air districts, who can and should implement these measures.

4. Vegetation and Wildlife

Impact BIO-3. Potential Loss of Sensitive Natural Communities and Special-Status Plants from Construction Activities (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental effect as identified in the PEIR.

Rationale for Finding

Under the Order, construction impacts would result from implementation of management practices that require physical changes, such as wellhead protection berms. It is difficult to determine to what extent management practices selected under the Order would change relative to existing conditions; thus, it is not possible to quantify any construction-related effects. However, it is logical to assume that implementation of the Order would result in selection of more management practices to meet water quality goals. Consequently, implementation of the Order may result in effects on vegetation from construction activities.

In general, management practices would be implemented on existing rice lands, which are unlikely to support native vegetation or special-status plants. However, construction that directly or indirectly affects natural vegetation communities adjacent to existing rice lands, particularly annual grasslands with inclusions of seasonal wetlands or vernal pools and riparian vegetation, could result in loss of sensitive wetland communities or special-status plants growing in the uncultivated or unmanaged areas. While it is anticipated that the loss of sensitive communities or special-status plants resulting from construction activities would be small, if any, data are insufficient to determine how much loss would occur. Consequently, this is considered a potentially significant impact. **Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measure BIO-MM-1 is described in the Mitigation Measures section II.D.4.

Impact BIO-6. Loss of Sensitive Natural Communities and Special-Status Plants from Construction Activities and Installation of Groundwater Monitoring Wells (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental impact as identified in the PEIR.

Rationale for Finding

Under the Order, construction impacts would result from the installation of groundwater monitoring wells. The placement of monitoring wells cannot be predetermined; consequently, the potential impacts on sensitive natural communities and special-status plants cannot be quantified. In general, management practices would be implemented on existing rice lands resulting in a less-than-significant impact. It was assumed that groundwater monitoring well placement also could be limited primarily to rice land and non-sensitive habitat. In addition, use of existing wells for groundwater monitoring is encouraged under the Order instead of requiring that new wells be constructed. However, if construction related to installation of groundwater monitoring wells required changes to managed wetlands or to natural vegetation communities that are adjacent to existing rice lands, there would be a potential for loss of vegetation in sensitive wetland communities or loss of special-status plants growing in the uncultivated or unmanaged areas. While it is anticipated that any loss of sensitive communities or special-status plants resulting from construction activities would be small, if any, data are insufficient to determine how much loss would occur. Consequently, this is considered a potentially significant impact. **Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources** has been incorporated into the Order to reduce this impact to a less-than-significant level (see section II.D). Mitigation measure BIO-MM-1 is described in the *Mitigation Measures* section II.D.4.

Impact BIO-7. Loss of Special-Status Wildlife from Construction Activities and Installation of Groundwater Monitoring Wells (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental impact as identified in the PEIR.

Rationale for Finding

Under the Order, construction impacts would result from installation of groundwater monitoring wells. The placement of monitoring wells cannot be predetermined; consequently, the potential impacts on special-status wildlife species and their habitat cannot be quantified.

In general, management practices would be implemented on existing rice lands resulting in a less-than-significant impact. It was assumed that placement of groundwater monitoring wells also could be limited primarily to rice land and non-sensitive habitat. In addition, use of existing wells for groundwater monitoring is encouraged under the Order instead of requiring that new wells be constructed. However, construction of groundwater monitoring wells that require changes to managed wetlands or to natural vegetation communities adjacent to existing rice lands could result in a loss of special-status wildlife species occurring in the uncultivated or unmanaged areas. While it is anticipated that any loss of sensitive communities or special-status wildlife species resulting from construction activities would be small, if any, data are insufficient to determine how much loss would occur. Consequently, this is considered a potentially significant impact.

Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources has been incorporated into the Order to reduce this impact to a less-than-significant level (see section II.D). Mitigation measure BIO-MM-1 is described in the *Mitigation Measures* section II.D.4.

5. Fisheries

Impact FISH-2. Temporary Loss or Alteration of Fish Habitat during Construction of Facilities for Management Practices (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental effect as identified in the PEIR.

Rationale for Finding

Under the Order, construction impacts would result from implementation of management practices that require physical changes to lands in the Sacramento Valley Area. These physical changes primarily include wellhead protection berms. Physical changes may be associated with implementation of other management practices. Installation of facilities for other management practices is unlikely to significantly exceed the baseline disturbance that occurs during routine field preparation. Construction of features associated with management practices may temporarily reduce the amount or quality of existing fish habitat in certain limited circumstances (e.g., by encroachment onto adjacent water bodies, removal of riparian vegetation, or reduction in water quality—such as increases in sediment runoff during construction). It is difficult to determine whether the management practices selected under the Order would change relative to existing conditions, and it is not possible to quantify any construction-related effects. Implementation of the Order may result in effects on fish habitat from construction activities related to management practices.

While it is anticipated that the loss of fish habitat resulting from construction activities would be small, if any, data are insufficient to determine how much loss would occur. Consequently, this is considered a potentially significant impact. **Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measure FISH-MM-1 is described in the *Mitigation Measures* section II.D.5.

Impact FISH-3. Permanent Loss or Alteration of Fish Habitat during Construction of Facilities for Management Practices (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental effect as identified in the PEIR.

Rationale for Finding

In some cases, permanent loss of fish habitat may occur as a result of construction required for implementation of management practices under the Order. Some of the impact may be due to loss of structural habitat (e.g., vegetation) whereas loss of dynamic habitat (e.g., wetted habitat) is not expected to occur. Because the extent of the loss is not known, the impact is considered potentially significant. **Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat** has been incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measures FISH-MM-1 is described in the *Mitigation Measures* section II.D.5.

Impact FISH-6. Temporary Loss or Alteration of Fish Habitat during Construction of Facilities for Management Practices and Groundwater Monitoring Wells (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental impact as identified in the PEIR.

Rationale for Finding

This impact is essentially the same as *Impact FISH-2* except that, in addition to the temporary loss or alteration of habitat due to construction of management practices, further loss or alteration of fish habitat may occur from construction of groundwater monitoring wells under the Order. Accordingly, the impact is considered potentially significant. **Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat** has been incorporated into the Order to reduce this impact to a less-than-significant level (see section II.D). Mitigation measure FISH-MM-1 is described in the *Mitigation Measures* section II.D.5.

Impact FISH-7. Permanent Loss or Alteration of Fish Habitat during Construction of Facilities for Management Practices and Groundwater Monitoring Wells (Less than Significant with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant environmental impact as identified in the PEIR.

Rationale for Finding

This impact is essentially the same as *Impact FISH-3* except that, in addition to the temporary loss or alteration of habitat due to construction of features associated with management practices, permanent loss or alteration of fish habitat may occur from construction of groundwater monitoring wells under the Order. Accordingly, the impact is considered potentially significant. **Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat** has been

incorporated into the Order to reduce this impact to a less-than-significant level. Mitigation measure FISH-MM-1 is described in the *Mitigation Measures* section II.D.5.

6. Cumulative Impacts

Cumulative Cultural Resource Impacts (Less than Cumulatively Considerable with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant cumulative environmental impact as identified in the PEIR.

Rationale for Finding

Installation of monitoring wells under the Order could result in cumulatively considerable impacts to cultural resources in concert with other, non-program-related agricultural enterprises and nonagricultural development in the program area. **Mitigation Measure CUL-MM-1: Avoid Impacts to Cultural Resources** has been incorporated into the Order to reduce the Order's contribution to this impact to a level that is not cumulatively considerable (see section II.D). The mitigation measure calls for identification of cultural resources and minimization of impacts to identified resources.

Cumulative Climate Change Impacts (Significant and Unavoidable)

Finding

Pursuant to CEQA Guidelines section 15091(a)(1), changes or alterations have been required in, or incorporated into, the Order, but these changes or alterations are not sufficient to reduce the significant environmental impact to less than significant as identified in the PEIR. As specified in section 15091(a)(2) of the State CEQA Guidelines, implementation of **Mitigation Measure CC-MM-1: Apply Applicable Air District Mitigation Measures to Reduce Construction and Operational GHG Emissions** for this impact is within the responsibility and jurisdiction of other public agencies that can and should enforce the implementation of these measures. Further, as specified in section 15091(a)(3) of the Guidelines, specific considerations make mitigation and alternatives infeasible. A statement of overriding consideration has been adopted, as indicated in the Statement of Overriding Considerations Supporting Approval of the Order presented below (section III).

Rationale for Finding

Unlike criteria pollutant impacts, which are local and regional, climate change impacts occur at a global level. The relatively long lifespan and persistence of greenhouse gases (GHGs) (as shown in Table 5.6-1 in the PEIR) require that climate change be considered a cumulative and global impact. As discussed in the PEIR, it is unlikely that any increase in global temperature or sea level could be attributed to the emissions resulting from a single project. Rather, it is more appropriate to conclude that, under the Order, GHG emissions would combine with emissions across California, the United States, and the globe to cumulatively contribute to global climate change.

Given the magnitude of state, national, and international GHG emissions (see Tables 5.6-2 through 5.6-4 in the PEIR), climate change impacts from implementation of the Order likely would be negligible. However, scientific consensus concludes that, given the seriousness of climate change, small contributions of GHGs may be cumulatively considerable. Because it is unknown to what extent, if any, climate change would be affected by the incremental GHG emissions produced under the Order, the impact to climate change is considered cumulatively considerable. **Mitigation Measure CC-MM-1: Apply Applicable Air District Mitigation Measures to Reduce**

Construction and Operational GHG Emissions is within the responsibility and jurisdiction of local agencies, who can and should implement these measures. **Mitigation Measure CC-MM-2: Apply Applicable California Attorney General Mitigation Measures to Reduce Construction and Operational GHG Emissions** has been incorporated into the Order; these measures will result in lower GHG emissions levels than had they not been incorporated, but they will not completely eliminate GHG emissions that could result from the Order. No feasible mitigation measures have been identified that would reduce this impact to a less-than-significant level. Mitigation measures are described in section II.D.

Cumulative Vegetation and Wildlife Impacts (Less than Cumulatively Considerable with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant cumulative environmental impact as identified in the PEIR.

Rationale for Finding

Tailwater return/sediment basins require substantial construction, with potential impacts on sensitive resources. Because existing conditions on all rice lands include the capability to hold and in some cases recycle tailwater, functioning as sediment basins/tailwater return systems (see Table 2-2 in the Economics Report), growers would not be constructing these types of systems. As discussed above in Section II.B, there are potential impacts identified in the PEIR that are not applicable to the Order, and will therefore have a less-than-significant impact. Implementation of management measures required by the Order has less-than-significant potential to adversely impact vegetation and wildlife. Rather, the types of practices that rice growers would likely implement include formation of wellhead protection berms and construction of groundwater monitoring wells only where existing wells are not adequate for program monitoring. These practices involve limited construction and would most likely be limited to lands that do not support sensitive biological resources.

The Central Valley of California has been subjected to extensive human impacts from land conversion, water development, population growth, and recreation. These impacts have altered the physical and biological integrity of the Central Valley, causing loss of native riparian vegetation along river systems, loss of wetlands, and loss of native habitat for plant and wildlife. **Mitigation Measures BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources** has been incorporated into the Order to reduce any potential contribution to this impact to a level that is not cumulatively considerable. Mitigation measures are described in section II.D.

Cumulative Fisheries Impacts (Less than Cumulatively Considerable with Mitigation)

Finding

As specified in section 15091(a)(1) of the State CEQA Guidelines, changes or alterations have been required in, or incorporated into, the Order that avoid or substantially lessen the significant cumulative environmental impact as identified in the PEIR.

Rationale for Finding

The ongoing impacts of impaired water quality from rice lands are likely to cumulatively affect fish, in combination with contaminants that remain in the Sacramento Valley from past activities. Such activities include mining and past use of pesticides such as DDT that remain within sediments. Because many of the existing impacts discussed in the PEIR section “Existing Effects of Impaired Water Quality on Fish” are cumulative, it is difficult to determine the relative contribution of rice

lands and other sources. For example, application of pesticides to nonagricultural lands such as urban parks and the resultant contaminant runoff also cumulatively contribute to the impacts of inputs from rice lands.

Given the U.S. Environmental Protection Agency’s ongoing federal Endangered Species Act (ESA) consultation process for pesticides as a result of recent court orders, it is reasonably foreseeable that further reasonable and prudent measures would be required by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) that would improve water quality within the Sacramento Valley. Revision of water quality control plans and total maximum daily loads (TMDLs) and the continued implementation of the Rice Pesticides Program⁴ also can be expected to improve water quality. These and other measures, in combination with the likely beneficial impacts of the Order, suggest that the cumulative impacts of the Order are not cumulatively considerable with implementation of mitigation. **Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat** has been incorporated into the Order to reduce these impacts to a less than cumulatively considerable level. Mitigation measures are described in section II.D.

D. Mitigation Measures

1. Cultural Resources

Mitigation Measure CUL-MM-1: Avoid Impacts to Cultural Resources

The measure described below will reduce the severity of impacts on significant cultural resources, as defined and described in sections 5.3.1 and 5.3.3 of the PEIR. Avoidance of such impacts also can be achieved when growers choose the least impactful effective management practices that will meet the Order’s water quality improvement goals and objectives. Note that these mitigation measures may not be necessary in cases where no ground-disturbing activities would be undertaken as a result of implementation of the Order.

Although cultural resource inventories and evaluations typically are conducted prior to preparation of a CEQA document, the size of the program area and the lack of specificity regarding the location and type of management practices that would be implemented following adoption of the Order rendered conducting inventories prior to release of the draft Order untenable. Therefore, where the Order’s water quality improvement goals cannot be achieved without modifying or disturbing an area of land or existing structure to a greater degree than through previously employed farming practices, individual farmers or third-party representatives will implement the following measures to reduce potential impacts to less-than-significant levels:

- Where construction within areas that may contain cultural resources cannot be avoided through the use of alternative management practices, conduct an assessment of the potential for damage to cultural resources prior to construction; this may include the hiring of a qualified cultural resources specialist to determine the presence of significant cultural resources.
- Where the assessment indicates that damage may occur, submit a non-confidential records search request to the appropriate California Historical Resources Information System (CHRIS) information center(s).
- Implement the recommendations provided by the CHRIS information center(s) in response to the records search request.

⁴ The Rice Pesticides Program requires the implementation of management practices to ensure water quality performance goals and objective in the Basin Plan are met.

- Where adverse impacts to cultural resources cannot be avoided, the grower's coverage under this Order is not authorized. The grower must then apply for its own individual waste discharge requirements. Issuance of individual waste discharge requirements would constitute a future discretionary action by the board subject to additional CEQA review .

In addition, California state law provides for the protection of interred human remains from vandalism and destruction. According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (section 8100), and the disturbance of Native American cemeteries is a felony (section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of the discovered human remains until the County Coroner has been notified, according to PRC section 5097.98, and can determine whether the remains are those of Native American origin. If the coroner determines that the remains are of Native American origin, the coroner must contact the Native American Heritage Commission (NAHC) within 24 hours (Health and Safety Code section 7050[c]). The NAHC will identify and notify the most likely descendant of the interred individual(s), who will then make a recommendation for means of treating or removing, with appropriate dignity, the human remains and any associated grave goods as provided in PRC section 5097.98.

PRC section 5097.9 identifies the responsibilities of the project proponent upon notification of a discovery of Native American burial remains. The project proponent will work with the most likely descendant (determined by the NAHC) and a professional archaeologist with specialized human osteological experience to develop and implement an appropriate treatment plan for avoidance and preservation of, or recovery and removal of, the remains.

Growers implementing management practices should be aware of the following protocols for identifying cultural resources:

- If built environment resources or archaeological resources, including chipped stone (often obsidian, basalt, or chert), ground stone (often in the form of a bowl mortar or pestle), stone tools such as projectile points or scrapers, unusual amounts of shell or bone, historic debris (such as concentrations of cans or bottles), building foundations, or structures are inadvertently discovered during ground-disturbing activities, the land owner should stop work in the vicinity of the find and retain a qualified cultural resources specialist to assess the significance of the resources. If necessary, the cultural resource specialist also will develop appropriate treatment measures for the find.
- If human bone is found as a result of ground disturbance, the landowner should notify the County Coroner in accordance with the instructions described above. If Native American remains are identified and descendants are found, the descendants may—with the permission of the owner of the land or his or her authorized representative—inspect the site of the discovery of the Native American remains. The descendants may recommend to the owner or the person responsible for the excavation work means for treating or disposing of the human remains and any associated grave goods, with appropriate dignity. The descendants will make their recommendation within 48 hours of inspection of the remains. If the NAHC is unable to identify a descendant, if the descendants identified fail to make a recommendation, or if the landowner rejects the recommendation of the descendants, the landowner will inter the human remains and associated grave goods with appropriate dignity on the property in a location not subject to further and future subsurface disturbance.

2. Noise

Mitigation Measure NOI-MM-1: Implement Noise-Reducing Construction Practices

Growers should implement noise-reducing construction practices that comply with applicable local noise standards or limits specified in the applicable county ordinances and general plan noise elements.

Mitigation Measure NOI-MM-2: Reduce Noise Generated by Individual Well Pumps

If well pumps are installed, Growers should enclose or locate them behind barriers such that noise does not exceed applicable local noise standards or limits specified in the applicable county ordinances and general plan noise elements.

3. Air Quality

Mitigation Measure AQ-MM-1: Apply Applicable Air District Mitigation Measures to Reduce Construction Emissions below the District Thresholds

Growers should apply appropriate construction mitigation measures from the applicable air district to reduce construction emissions. These measures will be applied on a project-level basis and may be tailored in consultation with the appropriate air district, depending on the severity of anticipated construction emissions.

Mitigation Measure AQ-MM-2: Apply Applicable Air District Mitigation Measures to Reduce Operational Emissions below the District Thresholds

Growers should apply appropriate mitigation measures from the applicable air district to reduce operational emissions. These measures were suggested by the district or are documented in official rules and guidance reports; however, not all districts make recommendations for operational mitigation measures. Where applicable, measures will be applied on a project-level basis and may be tailored in consultation with the appropriate air district, depending on the severity of anticipated operational emissions.

Mitigation Measure AQ-MM-3: Apply Applicable Air District Mitigation Measures to Reduce TAC/HAP Emissions

Growers should apply appropriate TAC and HAP mitigation measures from the applicable air district to reduce public exposure to DPM, pesticides, and asbestos. These measures were suggested by the district or are documented in official rules and guidance reports; however, not all districts make recommendations for mitigation measures for TAC/HAP emissions. These measures will be applied on a project-level basis and may be tailored in consultation with the appropriate air district, depending on the severity of anticipated TAC/HAP emissions.

4. Vegetation and Wildlife

Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources

Implementation of the following avoidance and minimization measures would ensure that the construction activities related to implementation of management practices and installation of monitoring wells on rice lands will minimize impacts on sensitive vegetation communities (such as riparian habitat and wetlands adjacent to the construction area) and special-status plants and wildlife species, as defined and listed in section 5.7.3 of the PEIR. In each instance where particular management practices could result in impacts on the biological resources listed above, growers should use the least impactful effective management practice to avoid such impacts.

Where the Order's water quality improvement goals cannot be achieved without incurring potential impacts, individual farmers or third-party representatives will implement the following measures to reduce potential impacts to less-than-significant levels:

- Where construction in areas that may contain sensitive biological resources cannot be avoided through the use of alternative management practices, conduct an assessment of habitat conditions and the potential for presence of sensitive vegetation communities or special-status plant and animal species prior to construction. This may include the hiring of a qualified biologist to identify riparian and other sensitive vegetation communities and/or habitat for special-status plant and animal species.
- Avoid and minimize disturbance of riparian and other sensitive vegetation communities.
- Avoid and minimize disturbance to areas containing special-status plant or animal species.
- Where adverse impacts on sensitive biological resources cannot be avoided, the grower's coverage under this Order is not authorized. The Grower must then apply for its own individual waste discharge requirements. Issuance of individual waste discharge requirements would constitute a future discretionary action by the board subject to additional CEQA review.

5. Fisheries

Mitigation Measure FISH-MM-1: Avoid and Minimize Impacts to Fish and Fish Habitat

This mitigation measure incorporates all measures identified in Mitigation Measure BIO-MM-1: Avoid and Minimize Impacts on Sensitive Biological Resources. In each instance where particular management practices could result in impacts to special-status fish species (see "Regulatory Classification of Special-Status Species" in section 5.8.2 of the PEIR), growers should use the least impactful effective management practice to avoid such impacts. Where the Order's water quality improvement goals cannot be achieved without incurring potential impacts, individual growers or third-party representatives will implement the following measures to reduce potential impacts to less-than-significant levels. Note that these measures may not be necessary in many cases and are dependent on the location of construction in relation to water bodies containing special-status fish:

- Where construction in areas that may contain special-status fish species cannot be avoided through the use of alternative management practices, conduct an assessment of habitat conditions and the potential for presence of special-status fish species prior to construction; this may include the hiring of a qualified fisheries biologist to determine the presence of special status fish species.
- Based on the species present in adjacent water bodies and the likely extent of construction work that may affect fish, limit construction to periods that avoid or minimize impacts to special-status fish species.
- Where construction periods cannot be altered to minimize or avoid impacts on special-status fish, the grower's coverage under this Order is not authorized. The grower must then apply for its own individual waste discharge requirements. Issuance of individual waste discharge requirements would constitute a future discretionary action by the board subject to additional CEQA review.

6. Climate Change

Mitigation Measure CC-MM-1: Apply Applicable Air District Mitigation Measures to Reduce Construction and Operational GHG Emissions

Several of the standard mitigation measures provided by Central Valley local air districts to reduce criteria pollutant emissions would also help to minimize GHG emissions (see section 5.6.5 of the PEIR). Measures to reduce vehicle trips and promote use of alternative fuels, as well as clean

diesel technology and construction equipment retrofits, should be considered by rice operations under the Order.

Mitigation Measure CC-MM-2: Apply Applicable California Attorney General Mitigation Measures to Reduce Construction and Operational GHG Emissions

A 2008 report by the California Attorney General's office entitled *The California Environmental Quality Act: Addressing Global Warming at the Local Agency Level* identifies various example measures to reduce GHG emissions at the project level (California Department of Justice 2008). The following mitigation measures and project design features were compiled from the California Attorney General's Office report. They are not meant to be exhaustive, but to provide a sample list of measures that could be incorporated into future project design. Only those measures applicable to the Order are included.

Solid Waste Measures

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).
- Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers.

Transportation and Motor Vehicles

- Limit idling time for commercial vehicles, including delivery and construction vehicles.
- Use low- or zero-emission vehicles, including construction vehicles.

E. Feasibility of Alternatives Considered in the EIR

The following text presents findings relative to the project alternatives. Findings about the feasibility of project alternatives must be made whenever the project within the responsibility and jurisdiction of the lead agency will have a significant environmental effect.

In July 2010, the Central Valley Water Board released, for public review, the Draft PEIR and Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program (Economics Report). In these reports, Alternatives 1-6 were evaluated considering environmental and economic impacts, and consistency with applicable state policies and law.⁵ In Volume II: Appendix A of the PEIR, at page 136, each alternative was found to achieve some of the program evaluation measures but not others. As is shown in Table 11 of Appendix A, no single alternative of Alternatives 1-5 achieved complete consistency with all evaluation measures. However, after review of each of the alternatives and their common elements (lead entity, monitoring type), it was clear that a program that more completely satisfied the evaluation measures could be developed by selecting from the best-performing elements of the proposed alternatives. Alternative 6, described in Appendix A of the Draft PEIR, was developed by selecting these best-performing elements and became the draft staff recommended alternative.

In consideration of comments received concerning Alternative 6 during the Draft PEIR review process, staff developed the recommended ILRP Framework, and prepared the *Staff Report on Recommended Irrigated Lands Regulatory Framework*, or ILRP Framework Report (Central Valley Water Board 2011). The Central Valley Water Board did not adopt the Framework, but advised staff to use the

⁵ Economic impacts of Alternatives 1-5 have been evaluated in the Economics Report. Staff was also able to use that analysis to estimate costs of the recommended program alternative (Alternative 6), since the recommended program alternative fell within the range of the five alternatives. This cost estimate is found in Appendix A of the PEIR.

Framework as a starting point to support the development of ILRP Orders. The Framework is based upon the sixth alternative, and is composed of elements from the range of alternatives evaluated in the PEIR. The requirements of the Order were developed considering the Framework as a starting point per Central Valley Water Board direction (Central Valley Water Board hearing, June 2011). Project-level review of the requirements in the Order has revealed that the requirements of the Order most closely resemble those described for Alternatives 4 and 2 of the PEIR, but do include elements from Alternatives 2-5.

The Order implements the long-term irrigated lands program for rice lands in the Sacramento Valley. The Alternatives in the PEIR have been developed for implementation throughout the entire Central Valley Region. The Order is intended to serve as a single implementing order in a series of orders that will implement the long-term irrigated lands program for the entire Central Valley. The findings below summarize why particular program alternatives are not being pursued.

Alternative 1: Full Implementation of the Current Program—No Project

Under Alternative 1, the Central Valley Water Board would renew the current program and continue to implement it into the future. This would be considered the “No Project” Alternative per CEQA guidance at Title 14 California Code of Regulations (CCR) section 15126.6(e)(3)(A): “When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the ‘No Project’ Alternative will be the continuation of the existing plan, policy, or operation into the future.” Given the reasonably foreseeable nature of the extension or renewal of the ongoing waiver, which would allow continuation of the existing program, Alternative 1 is best characterized as the “No Project” Alternative. This approach best serves the purpose of allowing the Central Valley Water Board to compare the impacts of revising the ILRP with those of continuing the existing program (14 CCR section 15126.6[e][1]).

Third-party groups would continue to function as lead entities representing growers (owners of irrigated lands, wetland managers, nursery owners, and water districts). This alternative is based on continuing representative monitoring to determine whether operations are causing water quality problems. Where monitoring indicates a problem, third-party groups and growers would be required to implement management practices to address the problem and work toward compliance with applicable water quality standards. This alternative would not establish any new Central Valley Water Board requirements for discharges to groundwater from irrigated agricultural lands.

Monitoring under this alternative would be the same as the representative monitoring required under the current ILRP. Under this monitoring scheme, third-party groups would work with the Central Valley Water Board to develop monitoring plans for Central Valley Water Board approval. These plans would specify monitoring parameters and site locations.

Finding

An order based on Alternative 1 is not being pursued to regulate rice operations in the Sacramento Valley instead of the Order because it would not substantially reduce or eliminate any of the significant adverse impacts of the Order (listed in the findings above) and it would not meet all of the goals and objectives of the program (program goals and objectives are described in Appendix A of the PEIR). Because Alternative 1 does not address discharges of waste from agricultural lands to groundwater, it would not be fully consistent with Program Goals 1 and 2:

- **Goal 1**—Restore and/or maintain the highest reasonable quality of State waters considering all the demands being placed on the water.
- **Goal 2**—Minimize waste discharge from irrigated agricultural lands that could degrade the quality of State waters.

In addition, the lack of a groundwater discharge component to this alternative makes it inconsistent with Goal 4 of the program:

- **Goal 4**—Ensure that irrigated agricultural discharges do not impair access by Central Valley communities and residents to safe and reliable drinking water.

Alternative 1 is also inconsistent with sections 13263 and 13269 of the California Water Code, the State Water Board's nonpoint source (NPS) program, and the State's antidegradation policy. These inconsistencies are documented in detail in the (PEIR), Appendix A, at pages 96-130. The Order is considered superior to Alternative 1 for implementation in the rice lands of the Sacramento Valley.

Alternative 2: Third-Party Lead Entity

Under Alternative 2, the Central Valley Water Board would develop a single mechanism or a series of regulatory mechanisms (WDRs or conditional waivers of WDRs) to regulate waste discharges from irrigated agricultural lands to ground and surface waters.

Third-party groups would function as lead entities representing growers. Regulation of discharges to surface water would be similar to Alternative 1 (the current ILRP). However, this alternative allows for a reduction in monitoring under lower threat circumstances and where watershed or area management objective plans are being developed. This alternative also includes requirements for development of groundwater quality management plans (GQMPs) to minimize discharge of waste to groundwater from irrigated lands. Under Alternative 2, local groundwater management plans or integrated regional water management plans could be utilized, all, or in part for ILRP GQMPs, with Central Valley Water Board approval. This alternative relies on coordination with the California Department of Pesticide Regulation (DPR) for regulating discharges of pesticides to groundwater.

Growers would be required to track implemented management practices and submit the results to the third-party group. Surface water monitoring under this alternative would be similar to Alternative 1. The third-party group would report summary results to the Central Valley Water Board. The third-party group would be required to summarize the results of groundwater and surface water monitoring and tracking in an annual monitoring report to the Central Valley Water Board.

Finding

An order based wholly on Alternative 2 is not being pursued to regulate rice operations in the Sacramento Valley instead of the Order because it would not substantially reduce or eliminate any of the significant adverse impacts of the Order (listed in findings above) and because it would not as consistently meet the program's goals and objectives as would the Order. As indicated in Appendix A, pages 96–130 of the PEIR, Alternative 2 would be consistent with most of the Program's goals and objectives, but would be only partially consistent with the State Water Board's nonpoint source policy and the state's antidegradation policy. Alternative 2 includes third-party GQMPs, but does not require groundwater quality monitoring. The Order is considered superior to Alternative 2 for implementation in the rice lands of the Sacramento Valley.

Alternative 3: Individual Farm Water Quality Plans

Under Alternative 3, growers would have the option of working directly with the Central Valley Water Board or another implementing entity (e.g., county agricultural commissioners) in development of an individual farm water quality management plan. Growers would individually apply for a conditional waiver or WDRs that would require Central Valley Water Board approval of their farm water quality management plan.

On-farm implementation of effective water quality management practices would be the mechanism to reduce or eliminate waste discharge to state waters. This alternative would provide incentive for individual growers to participate by providing growers with Central Valley Water Board certification that they are implementing farm management practices to protect state waters. This alternative relies on coordination with DPR for regulating discharges of pesticides to groundwater.

Unless specifically required in response to water quality problems, owners/operators would not be required to conduct water quality monitoring of adjacent receiving waters or underlying groundwater. Required monitoring would include evaluation of management practice effectiveness. The Central Valley Water Board, or a designated third-party entity, would conduct annual site inspections on a selected number of operations. They also would review available applicable water quality monitoring data as additional means of monitoring the implementation of management practices and program effectiveness.

Finding

An order based on Alternative 3 is not being pursued to regulate rice operations in the Sacramento Valley instead of the Order because it would not substantially reduce or eliminate any of the significant adverse impacts of the Order (listed in the findings above) and because it would not as consistently meet the ILRP's goals and objectives as would the Order. As indicated in Appendix A, pages 96–130 of the PEIR, Alternative 3 would be only partially consistent with the Central Valley Water Board's program objectives (Objectives 4 and 5) to coordinate with other programs such as TMDL development, Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) and WDRs for dairies; and to promote coordination with other agriculture-related regulatory and non-regulatory programs of the DPR, the California Department of Public Health (DPH), and other agencies. These objectives are:

- **Objective 4**—Coordinate with other Central Valley Water Board programs, such as the Grassland Bypass Project WDRs for agricultural lands, total maximum daily load development, CV-SALTS, and WDRs for dairies.
- **Objective 5**—Promote coordination with other regulatory and non-regulatory programs associated with agricultural operations (e.g., DPR, DPH Drinking Water Program, the California Air Resources Board, the California Department of Food and Agriculture, Resource Conservation Districts, the University of California Extension, Natural Resource Conservation Service, National Organic Program, California Agricultural Commissioners, State Water Board Groundwater Ambient Monitoring and Assessment programs, U.S. Geological Survey, and local groundwater programs [Senate Bill (SB) 1938, Assembly Bill (AB) 3030, Integrated Regional Water Management Plans]) to minimize duplicative regulatory oversight while ensuring program effectiveness.

Alternative 3 makes it more difficult to coordinate with these programs because it involves direct interaction by the Central Valley Water Board with individual growers, rather than with third-party entities. Also, the lack of mandatory surface and groundwater quality monitoring and the primary reliance on visual inspection of management practices reduces this alternative's ability to be consistent with the State Water Board's nonpoint source program. The Order is considered superior to Alternative 3 for implementation in rice lands in the Sacramento Valley.

Alternative 4: Direct Oversight with Regional Monitoring

Under Alternative 4, the Central Valley Water Board would develop WDRs and/or a conditional waiver of WDRs for waste discharge from irrigated agricultural lands to groundwater and surface water. As in Alternative 3, growers would apply directly to the Central Valley Water Board to obtain coverage ("direct oversight"). As in Alternative 3, growers would be required to develop and implement individual farm water quality management plans to minimize discharge of waste to

groundwater and surface water from irrigated agricultural lands. Alternative 4 would also allow for formation of responsible legal entities that could serve a group of growers who discharge to the same general location and thus could share monitoring locations. In such cases, the legal entity would be required to assume responsibility for the waste discharges of member growers, to be approved by the Central Valley Water Board, and ultimately to be responsible for compliance with ILRP requirements.

Discharge of waste to groundwater and surface water would be regulated using a tiered approach. Fields would be placed in one of three tiers based on their threat to water quality. The tiers represent fields with minimal (Tier 1), low (Tier 2), and high (Tier 3) potential threat to water quality. Requirements to avoid or minimize discharge of waste would be the least comprehensive for Tier 1 fields and the most comprehensive for Tier 3 fields. This would allow for less regulatory oversight for low-threat operations while establishing necessary requirements to protect water quality from higher-threat discharges. This alternative relies on coordination with DPR for regulating discharges of pesticides to groundwater.

For monitoring, growers would have the option of enrolling in a third-party group regional monitoring program. In cases where responsible legal entities were formed, these entities would be responsible for conducting monitoring. All growers would be required to track nutrient, pesticide, and implemented management practices and submit the results to the Central Valley Water Board (or an approved third-party monitoring group) annually. Other monitoring requirements would depend on designation of the fields as Tier 1, Tier 2, or Tier 3. Similar to Alternative 3, this alternative also includes requirements for inspection of regulated operations.

Finding

An order based wholly on Alternative 4 is not being pursued to regulate rice operations in the Sacramento Valley instead of the Order because it would not substantially reduce or eliminate any of the significant adverse impacts of the Order (listed in the findings above) and because it would not as consistently meet the Program's goals and objectives as would the Order. As indicated in Appendix A, pages 96–130 of the PEIR, Alternative 4 would meet most of the Program goals and objectives. However, it relies on Central Valley Water Board staff interaction directly with each irrigated agricultural operation, making it less effective at meeting the coordination objectives (Objectives 4 and 5) (page 103 of Appendix A in the PEIR):

- **Objective 4**—Coordinate with other Central Valley Water Board programs, such as the Grassland Bypass Project WDRs for agricultural lands, total maximum daily load development, CV-SALTS, and WDRs for dairies.
- **Objective 5**—Promote coordination with other regulatory and non-regulatory programs associated with agricultural operations (e.g., DPR, DPH Drinking Water Program, the California Air Resources Board, the California Department of Food and Agriculture, Resource Conservation Districts, the University of California Extension, Natural Resource Conservation Service, National Organic Program, California Agricultural Commissioners, State Water Board Groundwater Ambient Monitoring and Assessment program, U.S. Geological Survey, and local groundwater programs [SB 1938, AB 3030, Integrated Regional Water Management Plans]) to minimize duplicative regulatory oversight while ensuring program effectiveness.

Alternative 4 makes it more difficult to coordinate with these programs because it involves direct interaction by the Central Valley Water Board with individual growers, rather than with third-party entities. The Order is considered superior to Alternative 4 for implementation in rice lands in the Sacramento Valley.

Alternative 5: Direct Oversight with Farm Monitoring

Alternative 5 would consist of general WDRs designed to protect groundwater and surface water from discharges associated with irrigated agriculture. All irrigated agricultural operations would be required to individually apply for and obtain coverage under the general WDRs working directly with the Central Valley Water Board (“direct oversight”). This alternative would include requirements to (1) develop and implement a farm water quality management plan; (2) monitor (a) discharges of tailwater, drainage water, and storm water to surface water; (b) applications of irrigation water, nutrients, and pesticides; and (c) groundwater; (3) keep records of (a) irrigation water; (b) pesticide applications; and (c) the nutrients applied, harvested, and moved off the site; and (4) submit an annual monitoring report to the Central Valley Water Board. Similar to Alternative 3, Alternative 5 also includes requirements for inspection of regulated operations.

Finding

An order based on Alternative 5 is not being pursued to regulate rice operations in the Sacramento Valley instead of the Order because it would not substantially reduce or eliminate any of the significant adverse impacts of the Order (listed in the findings above) and it would not as consistently meet the Program’s goals and objectives as would the Order. As indicated in Appendix A, pages 96–130 of the PEIR, Alternative 5 would be only partially consistent with the Central Valley Water Board’s Program objectives (Objectives 4 and 5) to coordinate with other programs such as TMDL development, CV-SALTS and WDRs for dairies; and to promote coordination with other agriculture-related regulatory and non-regulatory programs of the DPR, DPH, and other agencies. These objectives are:

- **Objective 4**—Coordinate with other Central Valley Water Board programs, such as the Grassland Bypass Project WDRs for agricultural lands, total maximum daily load development, CV-SALTS, and WDRs for dairies.
- **Objective 5**—Promote coordination with other regulatory and non-regulatory programs associated with agricultural operations (e.g., DPR, DPH Drinking Water Program, the California Air Resources Board, the California Department of Food and Agriculture, Resource Conservation Districts, the University of California Extension, Natural Resource Conservation Service, National Organic Program, California Agricultural Commissioners, State Water Board Groundwater Ambient Monitoring and Assessment program, U.S. Geological Survey, and local groundwater programs [SB 1938, AB 3030, Integrated Regional Water Management Plans]) to minimize duplicative regulatory oversight while ensuring program effectiveness.

Alternative 5 makes it more difficult to coordinate with these programs because it involves direct interaction by the Central Valley Water Board with individual growers, rather than with third-party entities.

Also, an order based on Alternative 5, due to its high relative cost as compared to the Order, would not be consistent with Program Goal 3:

- **Goal 3**—Maintain the economic viability of agriculture in California’s Central Valley.

As indicated in the Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program (ICF International 2010), the program costs funded by growers and operators would be significantly higher than other alternatives (see Economics Report Tables 2-18 through 2-22). This high cost could affect the viability of a substantial amount of rice acres in the Sacramento Valley. The Order is considered superior to Alternative 5 for implementation in the rice lands in the Sacramento Valley.

Alternative 6: Staff Recommended Alternative in the Draft PEIR

Under Alternative 6, 8–12 general WDRs or conditional waivers of WDRs would be developed that would be geographic and/or commodity-based. The alternative would establish requirements for waste discharge from irrigated agricultural lands to groundwater and surface water. Similar to Alternatives 1 and 2, third-party groups would be responsible for general administration of the ILRP. The alternative would establish prioritization factors for determining the type of requirements and monitoring that would be applied. The prioritization would be applied geographically as a two tier system, where Tier 1 areas would be “low priority”, and Tier 2 would be “high priority.”

Program requirements, monitoring, and management would be dependent on the priority (Tier 1 or 2). Generally, this alternative requires regional management plans to address water quality concerns and regional monitoring to provide feedback on whether the practices implemented are working to solve identified water quality concerns. In Tier 1 areas, irrigated agricultural operations and third-party groups would be required to describe management objectives to be achieved, report on management practices implemented, and make an assessment of groundwater and surface water quality every 5 years. In Tier 2 areas, irrigated agricultural operations and third-party groups would be required to develop and implement ground and/or surface water quality management plans, as appropriate to address water quality concerns, report on management practices, and provide annual regional groundwater and surface water quality monitoring. Similar to Alternative 2, Alternative 6 would allow local groundwater management plans or integrated regional water management plans to substitute, all or in part, for ILRP GQMPs, with Central Valley Water Board approval.

Alternative 6 would establish a time schedule for compliance in addressing surface water and groundwater quality problems. The schedule would require compliance with water quality objectives within five to ten years for surface water problems and demonstrated improvement within five to ten years for groundwater problems.

Finding

An order based wholly on Alternative 6 is not being pursued to regulate rice operations in the Sacramento Valley instead of the Order because it would not substantially reduce or eliminate any of the significant adverse impacts of the Order (listed in findings above) and does not adequately reflect the clarifications and minor adjustments that were requested in comments on the Draft PEIR. The Order is considered superior to Alternative 6 for implementation in rice lands in the Sacramento Valley.

III. Statement of Overriding Considerations Supporting Approval of Waste Discharge Requirements General Order for Rice Growers in the Sacramento Valley

Pursuant to the requirements of CEQA (PRC sections 21002, 21002.1, and 21081) and the State CEQA Guidelines (15 CCR 15093), the Central Valley Water Board finds that approval of the Order, whose potential environmental impacts have been evaluated in the PEIR, and as indicated in the above findings, will result in the occurrence of a significant impact which is not avoided or substantially lessened, as described in the above findings. This significant impact is:

- Cumulative climate change.

Pursuant to PRC section 21081(b), specific overriding economic, legal, social, technological, or other benefits outweigh the unavoidable adverse environmental impacts. The specific reasons to support this approval, given the potential for the significant unavoidable adverse impact, are based on the following:

Economic Benefits

The water quality improvements expected to occur in both surface and groundwater throughout the Sacramento Valley as a result of implementing the Order are expected to create broad economic benefits for residents of the State. Control of pollutants contained in agricultural discharges, as summarized in pages 18–21 of Appendix A in the PEIR and documented in detail in the *Irrigated Lands Regulatory Program Existing Conditions Report*, should, over time, reduce water treatment costs for some communities in the Central Valley.

Consistency with NPS Policy and State Water Board Resolution 68-16 (Antidegradation Policy)

Waste discharges from rice operations has the potential to affect surface and groundwater quality. As documented in the *Irrigated Lands Regulatory Program Existing Conditions Report*, many state waters have been adversely affected due in part to waste discharges from irrigated agriculture, including rice operations. State policy and law requires that the Central Valley Water Board institute requirements that will implement Water Quality Control Plans (California Water Code sections 13260, 13269), the State Water Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy) and applicable antidegradation requirements (State Water Board Resolution 68-16). As described in the Program EIR, WDR findings and Information Sheet, the Board has considered the need for and expected benefits of an Order such as this, and finds the Order is a necessary component of the Central Valley Water Board's efforts to be consistent with state policy and law through its regulation of discharges from rice operations in the Sacramento Valley and to protect water quality. As documented in the PEIR Hydrology and Water Quality analysis, implementation of a long-term ILRP, of which the Order is an implementing mechanism, will improve water quality through development of farm management practices that reduce discharges of waste to state waters.

After balancing the above benefits of the Order against its unavoidable environmental risks, the specific economic, legal, and social benefits of the proposal outweigh the unavoidable adverse environmental effects, and these adverse environmental effects are considered acceptable, consistent with the Order, Central Valley Water Board Order R5-2014-0032.

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

**ATTACHMENT E TO ORDER R5-2014-0032
DEFINITIONS, ACRONYMS & ABBREVIATIONS**

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
SACRAMENTO VALLEY RICE GROWERS**

The following definitions, acronyms and abbreviations apply to the Order as related to discharges of waste from irrigated lands. All other terms shall have the same definitions as prescribed by the Porter-Cologne Water Quality Control Act (California Water Code Division 7), unless specified otherwise.

1. Antidegradation Policy – The State Water Board Resolution 68-16, "*Statement of Policy with Respect to Maintaining High Quality Waters in California*," requires existing high quality water to be maintained until it has been demonstrated that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of water, and will not result in water quality less than that prescribed in the Basin Plan. The Central Valley Water Board must establish standards in its orders for discharges to high quality waters that result in the implementation of best practicable treatment or control of the discharge necessary to avoid pollution or nuisance and to maintain the highest water quality consistent with maximum benefit to the people of the state. Resolution 68-16 has been approved by the USEPA to be consistent with the federal anti-degradation policy.
2. Aquifer – A geologic formation, group of formations, or part of a formation capable of yielding usable quantities of water to wells or springs (40 CFR Part 257.3-4).
3. Back flow prevention device – Back flow prevention devices are installed at the well or pump to prevent contamination of groundwater or surface water when fertilizers, pesticides, fumigants, or other chemicals are applied through an irrigation system. Back flow prevention devices used to comply with this Order must be those approved by USEPA, DPR, DPH, or the local public health or water agency.¹
4. Basin Plan – The Basin Plan is the Central Valley Regional Water Quality Control Plan for the Sacramento River and San Joaquin River Basin. The Basin Plan describes how the quality of the surface and groundwater in the Central Valley Region should be managed to ensure reasonable protection of beneficial uses. The Basin Plan includes beneficial uses, water quality objectives, and a program of implementation.
5. Certified Nitrogen Management Specialist – Certified nitrogen management plan specialists include Professional Soil Scientists, Professional Agronomists, Crop Advisors² certified by the American Society of Agronomy; or Technical Service Provider certified in nutrient management

¹ California Department of Public Health, Approved Backflow Prevention Devices List at <http://www.cdph.ca.gov/certlic/drinkingwater/pages/publications.aspx>. Requirements for backflow prevention for pesticide application are located in 6 CCR §6610.

² Should the California Department of Food and Agriculture and the California Certified Crop Adviser's establish a specific nitrogen management certification, any Certified Crop Adviser who prepares a nitrogen management plan must have a nitrogen management certification.

in California by the Natural Resources Conservation Service; or other specialist approved by the Executive Officer.

6. Degradation – Any measurable adverse change in water quality.
7. Durov Diagram – A graphical representation of water quality. The Durov diagram is an alternative to the Piper diagram. The Durov diagram plots the major ions as percentages of milli-equivalents in two base triangles. The total cations and the total anions are set equal to 100% and the data points in the two triangles are projected onto a square grid which lies perpendicular to the third axis in each triangle. This plot reveals useful properties and relationships for large sample groups. The main purpose of the Durov diagram is to show clustering of data points to indicate samples that have similar compositions.
8. Exceedance - For the purposes of this Order, an exceedance is a reading using a field instrument or detection by a California State-certified analytical laboratory where the detected result indicates an impact to the beneficial use of the receiving water when compared to a water quality standard for the parameter or constituent. Exceedances will be determined based on available data and application of the appropriate averaging period. The appropriate averaging period may be defined in the Basin Plan, as part of the water quality criteria established by the U.S. EPA, or as part of the water quality criteria being used interpret a narrative water quality objective. If averaging periods are not defined as part of the water quality objective or the water quality criteria being used, then the Central Valley Water Board Executive Officer may use its best professional judgment to determine an appropriate period.
9. Groundwater - Water in the ground that is in the zone of saturation. The upper surface of the saturate zone is called the water table.
10. Grower -- Defined to mean a producer of rice as defined in California Food and Agriculture Code, section 71032, or a landowner of land that leases, rents, or otherwise owns land that is used by a producer of rice. For both producers of rice and landowners, the land in question must be located within the Sacramento Valley, which includes the counties of Sacramento, Sutter, Yuba, Butte, Glenn, Colusa, Yolo, Placer, and Tehama.
11. High vulnerability area (groundwater) – Areas identified in the approved Groundwater Quality Assessment Report “...where known groundwater quality impacts exist for which irrigated agricultural operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from irrigated agricultural activities.” (see section IV.A.3 of the MRP) or areas that meet any of the following requirements for the preparation of a Groundwater Quality Management Plan (see section VIII.F of the Order): (1) there is a confirmed exceedance³ (considering applicable averaging periods) of a water quality objective or applicable water quality trigger limit (trigger limits are described in section VII of the MRP) in a groundwater well and irrigated agriculture may cause or contribute to the exceedance; (2) the Basin Plan requires development of a groundwater quality management plan for a constituent or constituents discharged by irrigated agriculture; or (3) the Executive Officer determines that irrigated agriculture may be causing or contributing to a trend of degradation of groundwater that may threaten applicable Basin Plan beneficial uses.

³ A “confirmed exceedance of a water quality objective in a groundwater well” means that the monitoring data are determined to be of the appropriate quality and quantity necessary to verify that an exceedance has occurred.

12. High vulnerability area (surface water) – Areas that meet any of the following requirements for the preparation of a Surface Water Quality Management Plan (see section VIII.F of the Order): (1) an applicable water quality objective or applicable water quality trigger limit is exceeded (considering applicable averaging periods) twice in a three year period for the same constituent at a monitoring location (trigger limits are described in section VII of the MRP) and irrigated agriculture may cause or contribute to the exceedances; (2) the Basin Plan requires development of a surface water quality management plan for a constituent or constituents discharged by irrigated agriculture; or (3) the Executive Officer determines that irrigated agriculture may be causing or contributing to a trend of degradation of surface water that may threaten applicable Basin Plan beneficial uses.
13. Hydraulic conductivity – The volume of water that will move through a medium (generally soil) in a unit of time under a unit hydraulic gradient through a unit area measured perpendicular to the direction of flow (a measure of a soils ability to transmit water).
14. Hydraulic gradient – The change in total hydraulic head per unit distance in a given direction yielding a maximum rate of decrease in hydraulic head.
15. Hydraulic head - The height relative to a datum plane (generally sea level) of a column of water that can be supported by the hydraulic pressure at a given point in a groundwater system. For a well, the hydraulic head is equal to the distance between the water level in the well and the datum plane (sea level).
16. Impaired water body – A surface water body that is not attaining water quality standards and is identified on the State Water Board’s Clean Water Act section 303(d) list.
17. Irrigated lands – Land irrigated to produce crops or pasture for commercial purposes;⁴ nurseries; and privately and publicly managed wetlands.
18. Irrigation return flow –Surface and subsurface water which leaves the field following application of irrigation water.
19. Kriging – A group of geostatistical techniques to interpolate the value of a random field (e.g., contaminant level in groundwater) at an unobserved location from observations of its value at nearby locations.
20. Low vulnerability area (surface and groundwater) – are all areas not designated as high vulnerability for either surface or groundwater.
21. Management practices to protect water quality – A practice or combination of practices that is the most effective and practicable (including technological, economic, and institutional considerations) means of controlling nonpoint pollutants at levels protective of water quality.

⁴ For the purposes of this Order, commercial irrigated lands are irrigated lands that have one or more of the following characteristics:

- The landowner or operator holds a current Operator Identification Number/ Permit Number for pesticide use reporting;
- The crop is sold to a third party including, but not limited to, (1) an industry cooperative, (2) harvest crew/company, or (3) a direct marketing location, such as farmers’ markets;
- The landowner or operator files federal taxes using federal Department of Treasury Internal Revenue Service Form 1040, Schedule F *Profit or Loss from Farming*.

22. Monitoring – Monitoring undertaken in connection with assessing water quality conditions, and factors that may affect water quality conditions. Monitoring includes, but is not limited to, water quality monitoring undertaken in connection with agricultural activities, monitoring to identify short and long-term trends in water quality, nutrient monitoring, active inspections of operations, and management practice implementation and effectiveness monitoring. The purposes of monitoring include, but are not limited to, verifying the adequacy and effectiveness of the Order's requirements, and evaluating compliance with the requirements of the Order.
23. Nonpoint source waste discharge– The Sacramento and San Joaquin River Basin Plan states that *"A nonpoint source discharge usually refers to waste emanating from diffused locations."* Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. The term "nonpoint source" is defined to mean any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act. The Clean Water Act (CWA) defines a point source as a discernible, confined, and discrete conveyance, such as a pipe, ditch, or channel. Irrigated agricultural return flows and agricultural storm water runoff are excluded from the CWA's definition of point source. Nonpoint pollution sources generally are sources of water pollution that do not meet the definition of a point source as defined by the CWA.
24. Nuisance – "Nuisance" is defined in section 13050 of the Water Code as *"...anything which meets all of the following requirements:*
- (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.*
 - (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.*
 - (3) Occur during, or as a result of, the treatment or disposal of wastes."*
25. Nutrient – Any element taken in by an organism which is essential to its growth and which is used by the organism in elaboration of its food and tissue.
26. Nutrient consumption – A total quantity of a nutrient taken up by crop plants (to be distinguished from the total applied). Expressed as nutrient mass per land area, i.e., pounds/acre, nutrient consumption is typically described on an annual or crop cycle basis. Nutrients are contributed and lost from cropland through various human and natural processes.⁵ Considering nitrogen as an example, sources of nitrogen available for plant consumption include applied fertilizers (including compost and animal manures), nitrogen fixed from the atmosphere in the roots of leguminous plants, nitrogen released through the decomposition of soil organic matter and crop residues, and nitrogen applied in irrigation water. Nitrogen can be removed from the field in harvested material, returned to the soil through crop residue incorporation, incorporated into permanent structures of perennial crops, leached beyond the root zone in irrigation or storm water, released to the atmosphere through denitrification, volatilization or crop residue burning.
27. Off-property discharge – The discharge or release of waste beyond the boundaries of the agricultural operation or to water bodies that run through the agricultural operation.
28. Perched groundwater – Groundwater separated from an underlying body of groundwater by an unsaturated zone.

⁵ Descriptions of sources and losses of plant nutrients are available through UC Davis and UC Cooperative Extension. For example see Peacock, B. Pub. NG2-96, UCCE Tulare County
<http://cetulare.ucanr.edu/files/82026.pdf>

29. Piper Diagram -- A graphical representation of the chemistry of a water sample. The relative abundance of cations as percentages of milli-equivalents per liter (meq/L) of sodium, potassium, calcium, and magnesium are first plotted on the cation triangle. The relative abundance of chloride, sulfate, bicarbonate, and carbonate is then plotted on the anion triangle. The two data points on the cation and anion triangles are then combined into the quadrilateral field that shows the overall chemical property of the water sample.
30. Pollution – Defined in section 13050(l)(1) of the Porter-Cologne Water Quality Control Act as “...an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses. (B) Facilities which serve these beneficial uses.”
31. Receiving waters - Surface water or groundwater that receive or have the potential to receive discharges of waste from irrigated lands.
32. Requirements of applicable water quality control plans – Water quality objectives, prohibitions, total maximum daily load implementation plans, or other requirements contained in water quality control plans adopted by the Central Valley Water Board and approved according to applicable law.
33. Rice – The species *Oryza sativa* grown for human consumption.
34. Stiff Diagram – A graphical representation of the chemistry of a water sample. A polygon shaped figure created from four parallel horizontal axes using the equivalent charge concentrations (meq/L) of cations and anions. Cations are plotted on the left of the vertical zero axis and anions are plotted on the right.
35. Stormwater runoff – The runoff of precipitation from irrigated lands.
36. Surface water – Water pooled or collected at or above groundwater. Surface water includes, but is not limited to, natural streams, lakes, wetlands, creeks, constructed agricultural drains, agricultural dominated waterways, irrigation and flood control channels, or other non-stream tributaries. Surface waters include all waters of the United States and their tributaries, interstate waters and their tributaries, intrastate waters, and all impoundments of these waters. For the purposes of the Order, surface waters do not include water in agricultural fields.
37. Tailwater – The runoff of irrigation water from an irrigated field.
38. Total Maximum Daily Load (TMDL) - From the Code of Federal Regulations (CFR), 40 CFR 130.2(i), a TMDL is: “*The sum of the individual WLAs [wasteload allocations] for point sources and LAs [load allocations] for nonpoint sources and natural background. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. ...*”.
39. Toxicity – Refers to the toxic effect to aquatic organisms from waste contained in an ambient water quality sample.
40. Unsaturated Zone – The unsaturated zone is characterized by pore spaces that are incompletely filled with water. The amount of water present in an unsaturated zone varies widely and is highly sensitive to climatic factors.
41. Vadose – See unsaturated zone.

42. Waste – Includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for the purposes of disposal as defined in California Water Code section 13050(d). Wastes from irrigated lands that conform to this definition include, but are not limited to, earthen materials (such as soil, silt, sand, clay, rock), inorganic materials (such as metals, salts, boron, selenium, potassium, nitrogen, phosphorus), organic materials such as pesticides, and biological materials such as pathogenic organisms. Such wastes may directly impact beneficial uses (e.g., toxicity of metals to aquatic life) or may impact water temperature, pH, and dissolved oxygen.
43. Waste discharges from irrigated lands – The discharge or release of waste to surface water or groundwater. Waste discharges to surface water include, but are not limited to, irrigation return flows, tailwater, drainage water, subsurface (tile) drains, stormwater runoff flowing from irrigated lands, aerial drift, and overspraying of pesticides. Waste can be discharged to groundwater through pathways including, but not limited to, percolation of irrigation or storm water through the subsurface, backflow of waste into wells (e.g., backflow during chemigation), discharges into unprotected wells and dry wells, and leaching of waste from tailwater ponds or sedimentation basins to groundwater.

A discharge of waste subject to the Order is one that could directly or indirectly reach waters of the state, which includes both surface waters and groundwaters. Direct discharges may include, for example, discharges directly from piping, tile drains, wells, ditches or sheet flow to waters of the state, or percolation of wastes through the soil to groundwater. Indirect discharges may include aerial drift or discharges from one parcel to another parcel and then to waters of the state. See also the definition for “waste”.

44. Waters of the State – Is defined in Water Code section 13050 as “*any surface water or groundwater, including saline waters, within the boundaries of the State.*”
45. Water Quality Criteria – Levels of water quality required under section 303(c) of the Clean Water Act that are expected to render a body of water suitable for its designated uses. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes. The California Toxics Rule adopted by USEPA in April 2000 sets numeric water quality criteria for non-ocean surface waters of California for a number of toxic pollutants.
46. Water Quality Objectives – Defined in Water Code section 13050 as “*limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specified area.*” Water quality objectives may be either numerical or narrative and serve as water quality criteria for purposes of section 303 of the Clean Water Act.
47. Water quality problem – Exceedance of an applicable water quality objective or a trend of degradation that may threaten applicable Basin Plan beneficial uses.
48. Water Quality Standards – Provision of State or Federal law that consist of the designated beneficial uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the uses of that particular waterbody, and an anti-degradation statement. Water quality standards include water quality objectives in the Central Valley Water Board’s two Basin Plans, water quality criteria in the California Toxics Rule and National Toxics Rule

adopted by USEPA, and/or water quality objectives in other applicable State Water Board plans and policies. Under section 303 of the Clean Water Act, each state is required to adopt water quality standards.

Acronyms and Abbreviations

2008 Farm Bill	Food, Conservation, and Energy Act of 2008
APN	assessor's parcel number
Basin Plan	<i>Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.)</i>
BPTC	best practicable treatment or control
CAC	county agricultural commissioner
CCA	Certified Crop Advisor
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CEDEN	California Environmental Data Exchange Network
Central Valley Water Board	California Regional Water Quality Control Board, Central Valley Region
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
COC	constituent of concern
CRC	California Rice Commission
CRHR	California Register of Historic Resources
CTR	California Toxics Rule
CV RDC	Central Valley Regional Data Center
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWC	California Water Code
DO	dissolved oxygen
DPH	California Department of Public Health
DPM	diesel particulate matter
DPR	California Department of Pesticide Regulation
DWR	California Department of Water Resources
EC	electrical conductivity
ECR	Existing Conditions Report
EDD	electronic data deliverable
EIR	environmental impact report
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	federal Endangered Species Act
GAMA	Groundwater Ambient Monitoring Assessment
GAR	Groundwater Quality Assessment Report
GeoTracker ESI	GeoTracker Electronic Submittal of Information Online System
GHG	greenhouse gas
GIS	geographic information system
GPS	global positional system
GQMP	Groundwater Quality Management Plan
GWPA	Groundwater Protection Area
HAP	hazardous air pollutant
HVA	high vulnerability area
ILRP	Long-Term Irrigated Lands Regulatory Program
MCL	maximum contaminant level

MDL	method detection limit
MMRP	Mitigation Monitoring and Reporting Program
MPEP	management practice evaluation program
MRP	monitoring and reporting program
MWICR	Monitoring Well Installation Completion Report
MWISP	Monitoring Well Installation and Sampling Plan
NAD83	North American Datum 1983
NAHC	Native American Heritage Commission
NAVD88	North American Vertical Datum 1988
NMFS	National Marine Fisheries Service
NMP	nitrogen management plan
NOT	notice of termination
NOV	notice of violation
NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint source
NPS Policy	State Water Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTR	National Toxics Rule
PAMs	polyacrylamides
PCPA	Pesticide Contamination and Prevention Act
PEIR	Long-Term Irrigated Lands Regulatory Program Final Program EIR (Final and Draft) (Certified by Resolution No. R5-2011-0017)
PRC	California Public Resources Code
PUR	pesticide use report, CA DPR
QAPP	quality assurance project plan
QA/QC	quality assurance and quality control
RCD	Resource Conservation District
RL	reporting limit
RWD	report of waste discharge
SB	Senate Bill
SIP	<i>Policy of Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of CA (State Implementation Plan)</i>
SQMP	Surface Water Quality Management Plan
State Water Board	State Water Resources Control Board
SSURGO	NRCS Soil Survey Geographic Database
SWAMP	surface water ambient monitoring program
TAC	toxic air contaminant
TDS	total dissolved solids
TIE	toxicity identification evaluation
TMDL	total maximum daily load
TOC	total organic carbon
TRS	township, range, and section
TSS	total suspended solids
TST	test of significant toxicity (USEPA method)
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDRs	waste discharge requirements